THE IRON AGE

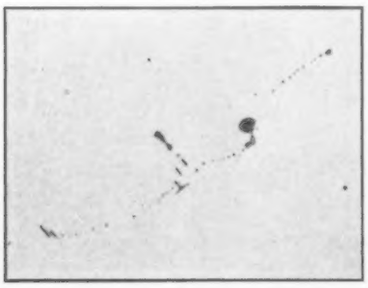
Contents

JUNE 8, 1939

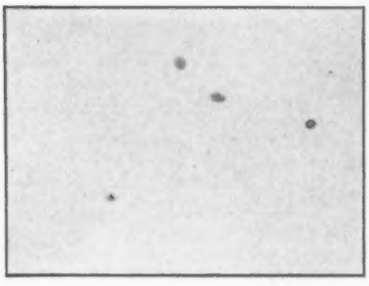
How Calcium-Silicon raises strength and ductility of Cast Steel

THE use of calcium-silicon with reduced amounts of aluminum instead of aluminum alone for deoxidizing cast steel in the ladle eliminates harmful chain-type, eutectic sulphide inclusions and thus raises the strength and ductility of the steel. The averaged values of a number of tests on .36 to .40 carbon steel showed that this treatment raised yield strength 7.15 per cent, tensile strength 6.49 per cent, elongation 2.52 per cent, and reduction of area 5.82 per cent.

Ask to have one of our metallurgists call and explain more fully how you can improve cast steel with calcium-silicon. He can help make your use of this and other "Electromet" ferro-alloys more profitable, without obligation. Electro Metallurgical Company, Unit of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York, N. Y. In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario.



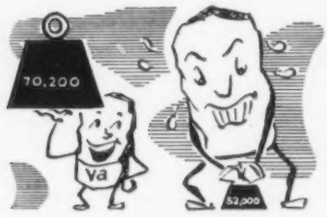
Harmful chain-type, eutectic sulphide inclusions segregated along grain boundaries in cast steel not treated with calcium-silicon. Magnification—500 diameters.



Inclusions in cast steel treated with calcium-silicon. The inclusions are dispersed and the steel has improved strength and ductility. Magnification—500 diameters. (Both micrographs slightly reduced in reproduction.)

Items of Interest about other "Electromet" Ferro-Alloys

Vanadium Increases Strength and Toughness of Medium-Manganese Steel Castings — The averaged values of a series of tests showed that the addition of 0.10 per cent vanadium to a medium-manganese steel raised the yield point from 52,000 to 70,200 lb. per sq. in., and increased the Izod impact from



20 to 58.7 ft.-lb. Tensile strength, elongation, and reduction of area were also slightly increased.

Use 3 Per Cent Chromium Steels for Wear-Resistant Castings — The 3 per cent chromium steels are easily hardened and relatively inexpensive. They are particularly suitable in service involving severe abrasion but little or no impact.

Zirconium Improves Machinability of Steel Castings — Zirconium in steel castings retards segregation of impurities at the grain boundaries, eliminates hard spots, reduces grain size and produces a cleaner and more uniform steel. As a result, machinability is greatly improved.

• • •

If you want more information about these and the many other "Electromet" ferro-alloys and metals and the service that goes with their purchase, write for the booklet, "Electromet Products and Service."

Electromet
Trade-Mark
Ferro-Alloys & Metals

The word "Electromet" is a registered trademark of Electro Metallurgical Company

PRODUCTS OF A UNIT OF UCC UNION CARBIDE AND CARBON CORPORATION

HE'S BACK IN 1899

and doesn't know it!

THIS is the second of six graphic presentations dealing with the improved machine as a builder of employment and of mass consuming power.

The first of this series appeared in *The Iron Age* of May 18. It dealt with the threat to progress and to the American System of Enterprise involved in the widespread present day recurrence of the age old antagonism to mechanical improvement.

This second installment deals with national income. It shows that more purchasing power for all of us can come only through accumulating new time savings by encouraging the fullest and freest use of time saving machinery.

1

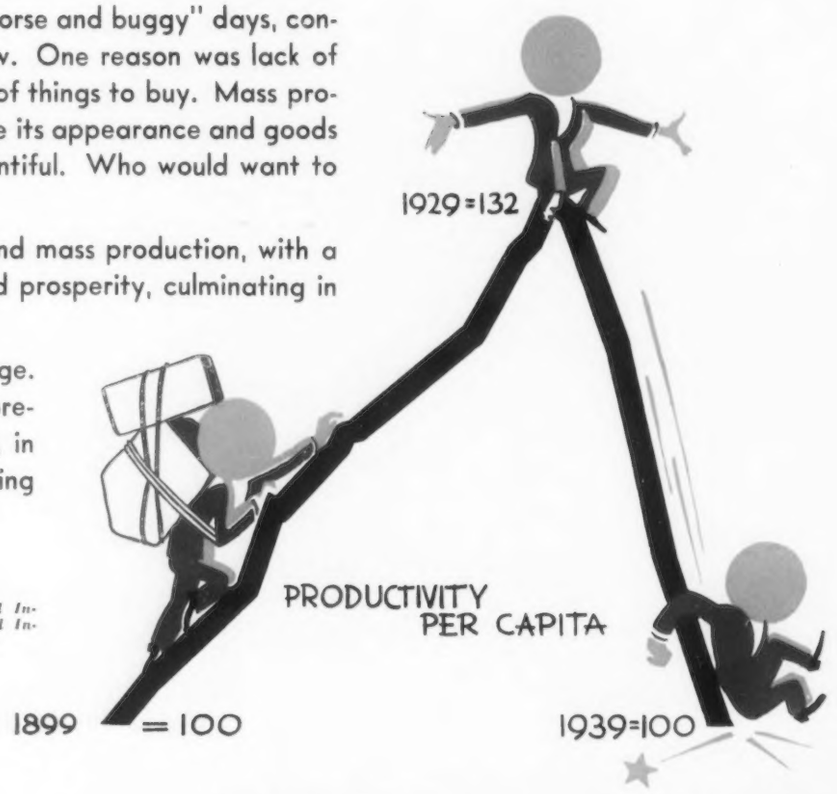
BACK in 1899, in the "horse and buggy" days, consuming power was low. One reason was lack of income; another was lack of things to buy. Mass production had not then made its appearance and goods and services were not plentiful. Who would want to go back to those times?

After 1899 came the automobile and mass production, with a 30-year climb in consuming power and prosperity, culminating in the silk shirt era of 1929.

And after that—the headlong plunge. In 10 years we lost the gains of the previous 30. And we find ourselves now, in 1939, back at the low level of consuming power of 1899.*

How can we climb back again?

*Index of per capita private production of National Income, 1899—100; 1929—132; 1939—100. National Industrial Conference Board.



2

WE cannot expect to enjoy a 1929 standard of living if we merely produce income at the rate people did in 1899.

Our national consuming power obviously depends upon the national income that we produce. National income finances our buying power. "It's all there is, there isn't any more."

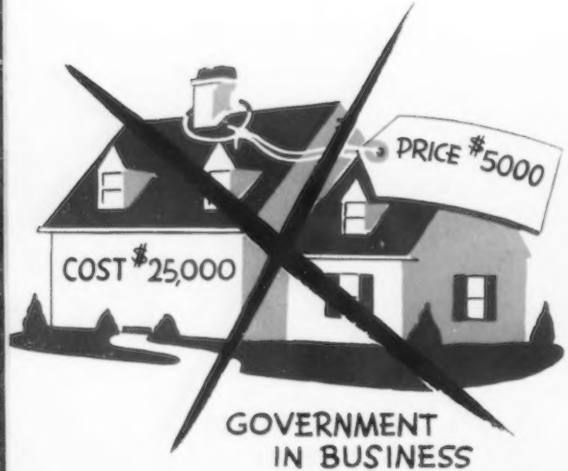
Our problem is to increase national income. Everybody agrees to that. The question is: How?

Pump Priming?

Government in Business?

Shorter Working Hours?

Slowing Down Machines?

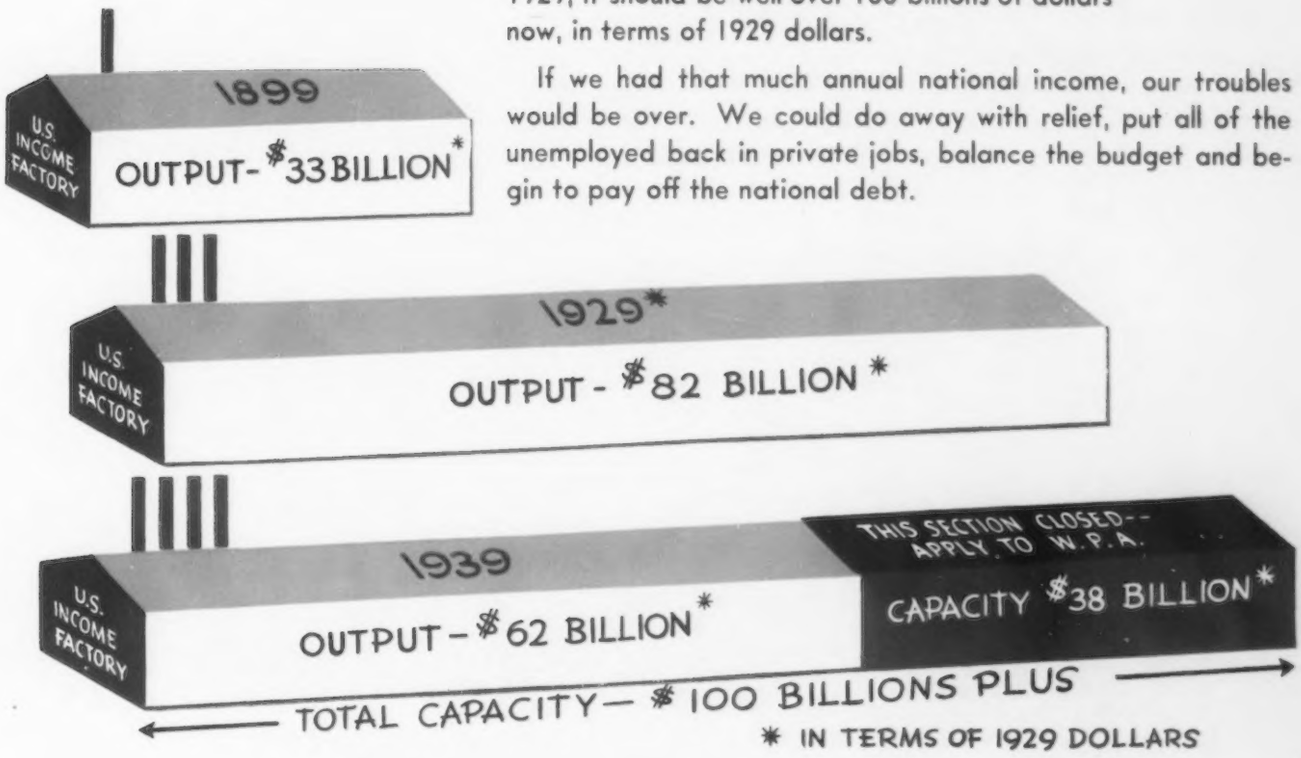


3

HOW large a national income should we have today, if we had not met "Old Man Depression" back in 1930?

Based on the rate at which we increased our national income during the 30 years preceding 1929, it should be well over 100 billions of dollars now, in terms of 1929 dollars.

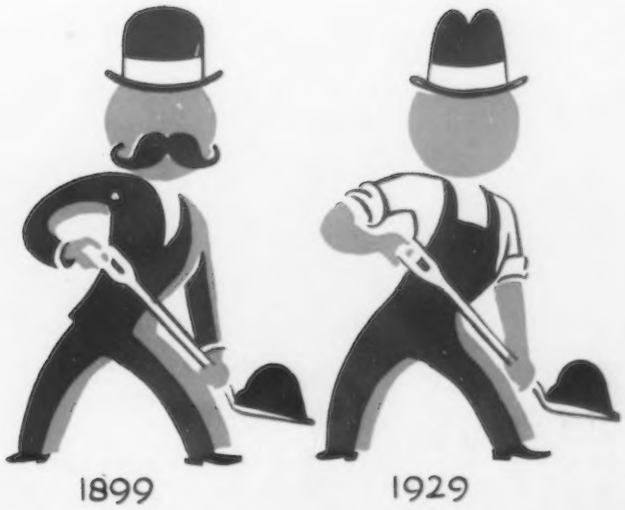
If we had that much annual national income, our troubles would be over. We could do away with relief, put all of the unemployed back in private jobs, balance the budget and begin to pay off the national debt.



4

HOW can we boost national income to where it belongs? Now I'll ask one. Why not do it the way we did it between 1899 and 1929?

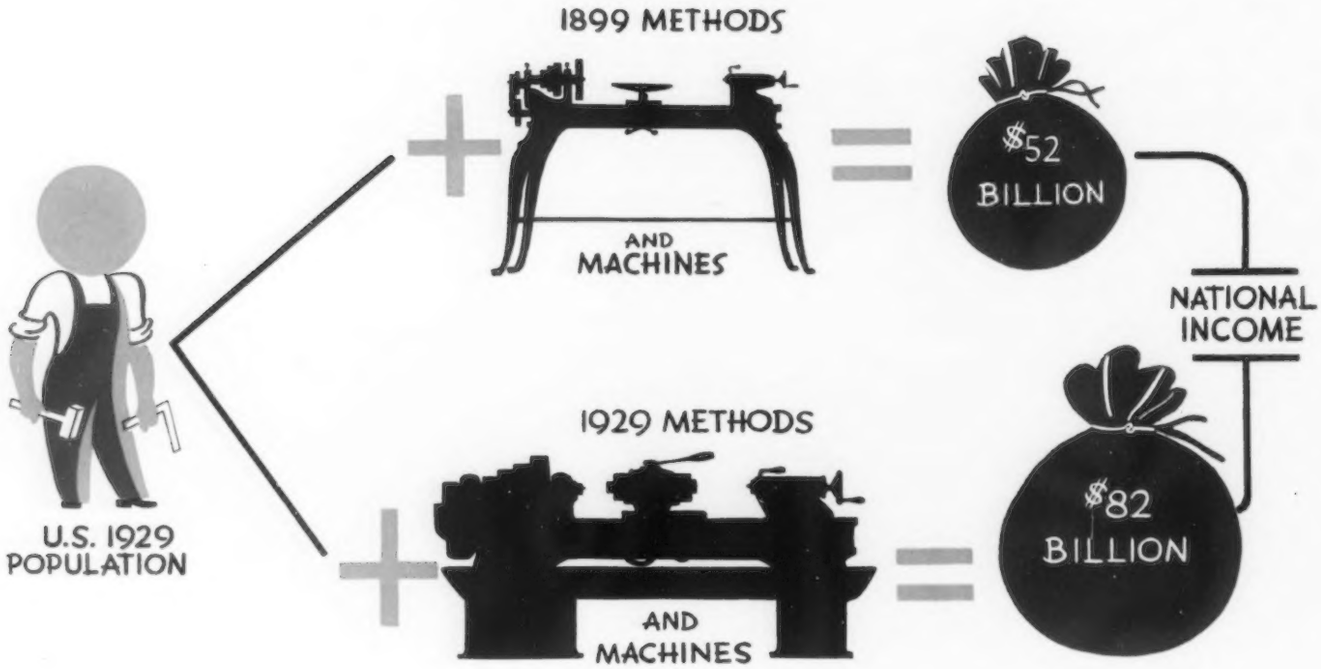
We did it then by investing in time savings. Time savings made possible by increased productivity. And that, in turn, made possible, by improved methods and improved machinery.



Consider for a moment two workers. One of 1899 and one of 1929. Little difference is there between them except for the mustache.

Using the same tools, the worker of 1929 could not produce a bit more per hour than the worker of 1899. And not so much in a week, because of shorter hours.

When you stop to think of that, isn't it evident that time saving methods and better tools alone made possible greater individual producing and consuming power and, hence, greater national income?



5

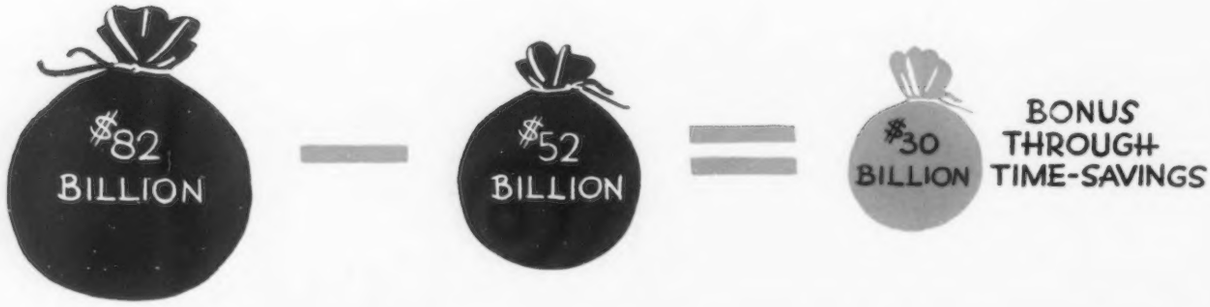
OF course there was a larger population in 1929 than in 1899, and therefore more workers. Sixty per cent more in fact. And 60 per cent more people ought to create 60 per cent more national income.

Adding 60 per cent to the national income of 1899 and then deducting 13 per cent for the shorter hours worked in 1929, we get a national income of $52 billion, in terms of 1929 dollars.

This is what our National income would have been in 1929 instead of $82 billion, if the workers of 1929 had used the same methods and the same tools as did the workers of 1899.

* * *

What we really do, all of us, is to work at making national income dollars. And we can turn out a lot more of them by machinery than by hand.



WHERE did the $30 billion come from that is the difference between the actual national income of 1929 and what it would have been had we then been compelled to use the methods and the tools of 1899?

It did not come because of greater skill, strength or application on the part of the workers. It came solely and simply because of the continued application, in all lines of effort, of better methods, more power, improved machinery.

In other words, this $30 billion bonus (of which over 64 per cent went to our wage earners) came because of a nation-wide policy of investing in time savings. There was nowhere else for it to come from.

That former and now forgotten national policy of encouraging time savings and promoting efficiency and productivity was responsible for the steady gains in wages, living standards and general prosperity which took place between 1899 and 1929.

6

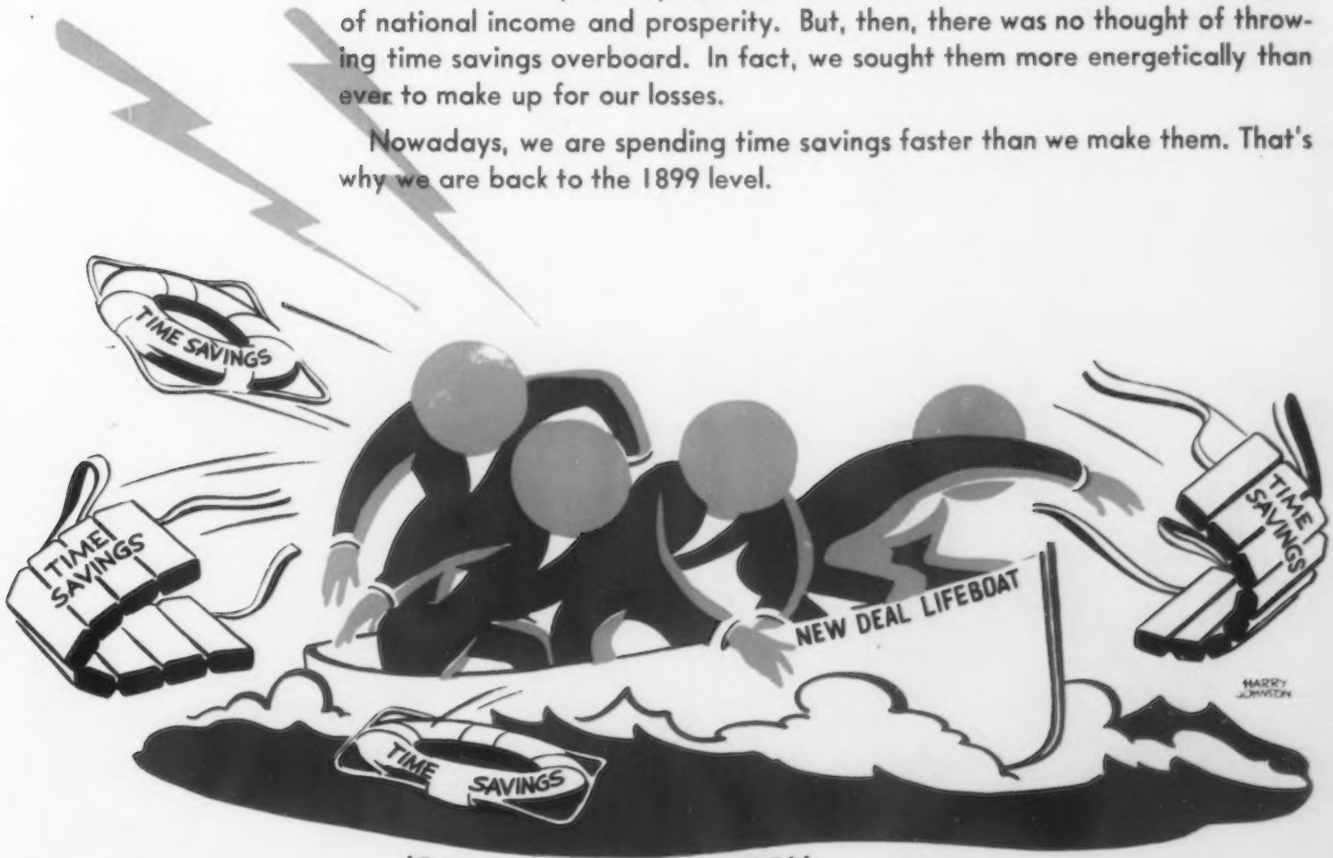
WHAT has happened, since 1930, to send us back to the 1899 income production level?

Private enterprise, so far as management is concerned, has not altered its attitude toward time savings. It values efficiency as highly as ever.

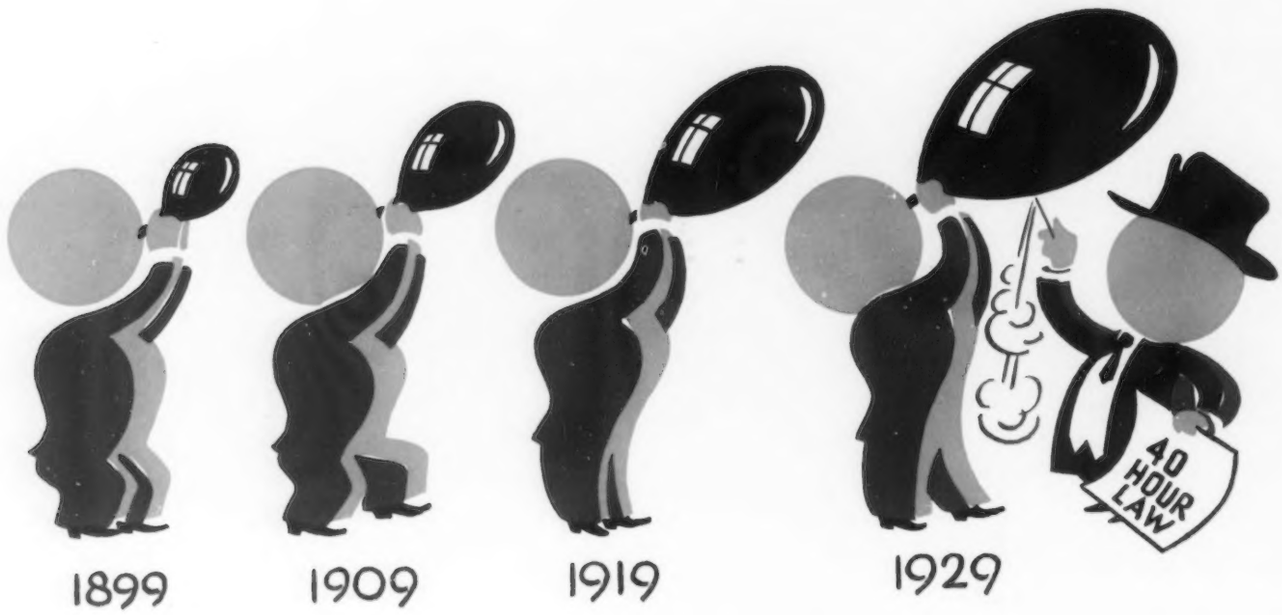
But what it has been able to accomplish in time saving since 1930 has been more than offset by time spending. For this new national policy of spend and spend has affected time savings as well as money savings.

We have had past depressions and have come out of them to new heights of national income and prosperity. But, then, there was no thought of throwing time savings overboard. In fact, we sought them more energetically than ever to make up for our losses.

Nowadays, we are spending time savings faster than we make them. That's why we are back to the 1899 level.



1930-1939 DEPRESSION



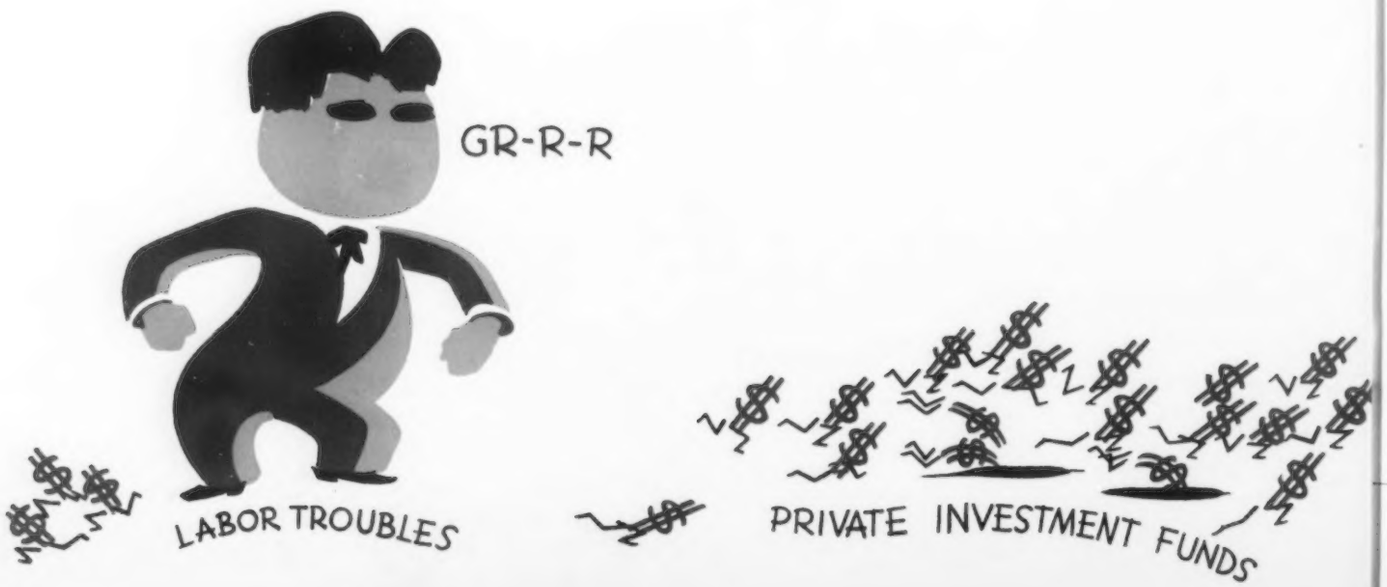
7 NOWADAYS forces that were unknown before 1929 are at work devouring and offsetting time savings. A dozen of them and any one capable of eating up our time savings as fast as they are produced.

Take, for example, legislation to limit working hours.

It may surprise you to know that all gains in efficiency and in productivity per man—in other words, all time savings made since 1930—have been completely offset just by our reduction in working hours per week.

The average annual gain in national income production, above that due to population growth, was 1.3 per cent per year for the 30-year period from 1899 to 1929. This is the rate of elevation of the American standard of living during that period. In addition to that, we reduced working hours at the rate of ½ per cent per year. The productivity gain of 1.3 per cent was *net*, above this.

Since 1929 we have reduced working hours at the rate of 2 per cent per year, not counting the reduction due to unemployment. We have reduced them from 50 to 40 with further reduction mandatory by law. A net retrogression of 0.7 per cent per year in time saving, just from this one cause among many.



8

TIME savings, in this day and age, are most commonly produced by the use of power and improved machinery. They are not hand made. Machinery that is capable of turning out time savings is expensive. It must be financed. In the past it has been financed from profits and from funds seeking profitable investment.

The corporate profits tax has put a stopper on the reinvestment of profits. Made it too expensive. And the uncanny sixth sense which tells money that something is wrong has sent private investment funds into hiding.

They have shrunk from an average of $3.7 billions per year for the period from 1920—1929 to a present annual level of $1 billion or less.

Capital won't stick its neck out to have its head chopped off.

9

PRIVATE savings have the natural caution that goes with an owner's first hand appreciation of their value. When they see a combination of circumstances which makes it difficult or impossible to earn a profit or to keep the capital intact, they stay in hiding. When capital stays in hiding, a wise Government should seek to coax it out by reassuring it; not force it out by conscripting it.

Even if all of the savings in America were to be conscripted and put to work, they would follow the former pump priming billions down the knot hole. Public or private investment dollars alike cannot survive so long as time savings are outweighed by time spendings.

Reaffirmation of a national policy of time and money saving and renunciation of the policy of time and money spending are the essential steps toward putting dollars and machines to work to build national income.

10

INVENTION, improvement and the use of better tools and machinery are the real creators of time savings. And only through making time savings, can we increase everyone's share of the national income by making it larger.

Labor has the greatest stake in this constructive use of time savings, because it is the principal beneficiary. It gets the largest portion of the total national income, in the form of wages. And its share has been an increasing one. It now averages over 65 per cent.

There cannot be anything basically wrong with the use of improved machinery in our system of enterprise, when it proved itself capable of increasing national income by $30 billions, of which the lion's share went to wages, which means employment.

Passing laws to limit the national debt, or to balance the budget or to compel economy in public expenditures, or to prevent labor troubles, or to keep Government from competing with private business would do the national income no harm, because these things are destroyers of time savings.

THE MACHINE WOULD DO THE JOB FOR US IF WE WOULD LET IT

But passing laws to reduce or nullify or restrict the creation of new machine-made time savings would condemn us to progressively less and less consuming power, fewer and fewer jobs and to shrinking wages.

Do away with the time spenders that are now offsetting the time savings of the machine and we will be back on the road toward the $100 billion annual national income.

MACHINES CREATE TIME SAVINGS
TIME SAVINGS CREATE NATIONAL INCOME
NATIONAL INCOME CREATES PURCHASING POWER
PURCHASING POWER CREATES JOBS AND WAGES.

(The next presentation in this series will appear in The Iron Age of July 13.)

MORE THAN 41 Years OF DOING ONE THING WELL

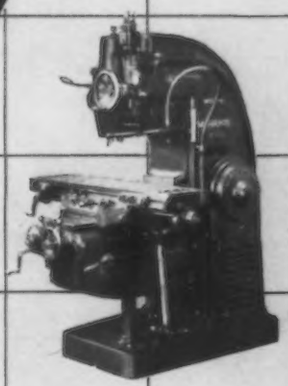
1899
12 EMPLOYEES

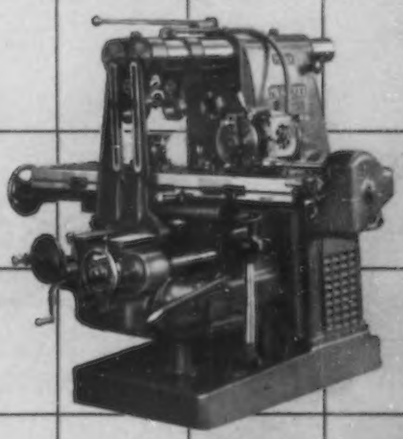
1909
151 EMPLOYEES

1919
653 EMPLOYEES

1929
904 EMPLOYEES

1939
1352 EMPLOYEES





Early in its business life, Kearney & Trecker Corporation included among its products lathes, boring bars, grinders, special machine tools, etc., . . . but soon discovered that if they were to excel, it would be necessary to concentrate their efforts upon one product. The soundness of this policy has been demonstrated.

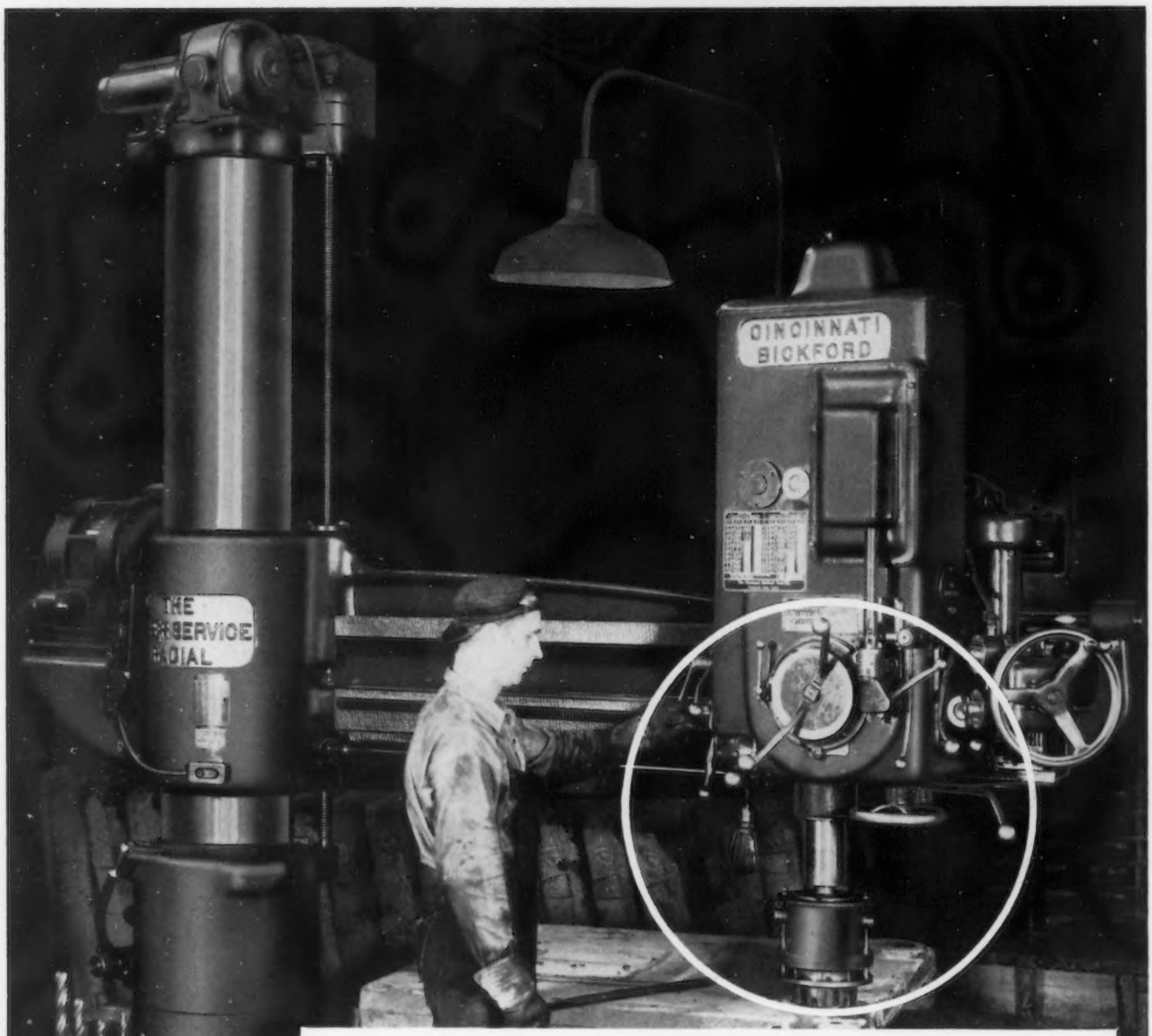
KEARNEY & TRECKER CORPORATION
MILWAUKEE, WIS., U. S. A.

MORE THAN 41 years OF DOING ONE THING WELL

K&T

Milwaukee **MILLING MACHINES**

PRODUCTION TELLS *the* STORY

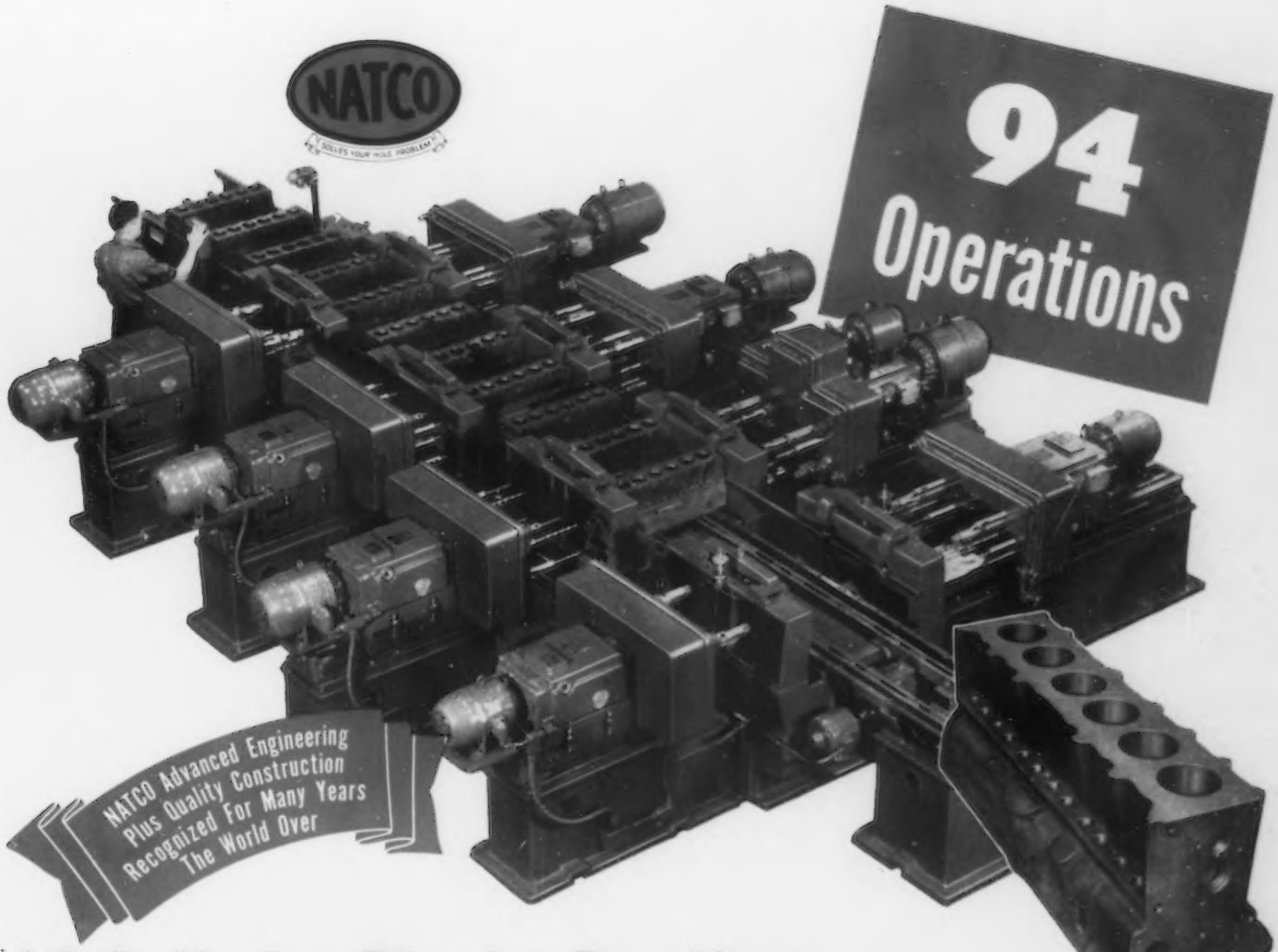


CONVENIENCE SPEEDS PRODUCTION

A most important factor in the prosperity to come, is the convenient, efficiently controlled machine tool, which by eliminating unnecessary motions and effort, reduces costs, permits distribution to broader markets and increases employment. An example is this machine, tapping cored holes in radiator sections at the Detroit plant of the U. S. Radiator Corp. Unsolicited, they say, "Your 6′ Super Service Radial is giving splendid satisfaction."

CINCINNATI BICKFORD engineers will gladly study your drilling requirements without obligation.

THE CINCINNATI BICKFORD TOOL CO.
OAKLEY, CINCINNATI, OHIO, U.S.A.



90 Cylinder Blocks Per Hour On This NATCO "HOLEWAY" Machine

Located in one of the country's most modern automobile plants and attended by a single operator . . . this NEW NATCO "HOLEWAY" machine is performing a total of 94 drilling, core drilling, chamfering, counterboring, and reaming operations on 90 cylinder blocks per hour.

It is a two-way horizontal eight headed combination driller and tapper. It is built of four right hand and four left hand NATCO HOLEUNITS, each complete with spindle boxes . . . containing a total of 84 drilling spindles and 4 tapping spindles. Tapping spindles are arranged with individual lead screws and are complete with tap holders . . . and are driven by an auxiliary NATCO Tapping Unit mounted on a NATCO HOLEUNIT.

Mounted between the heads is a straight line automatic mechanical indexing fixture. Two cylinder blocks are loaded in the loading station (to rear of illustration) and are automatically indexed from one station to another as the required operations are performed. The blocks are then ejected in the sixth or unloading station.

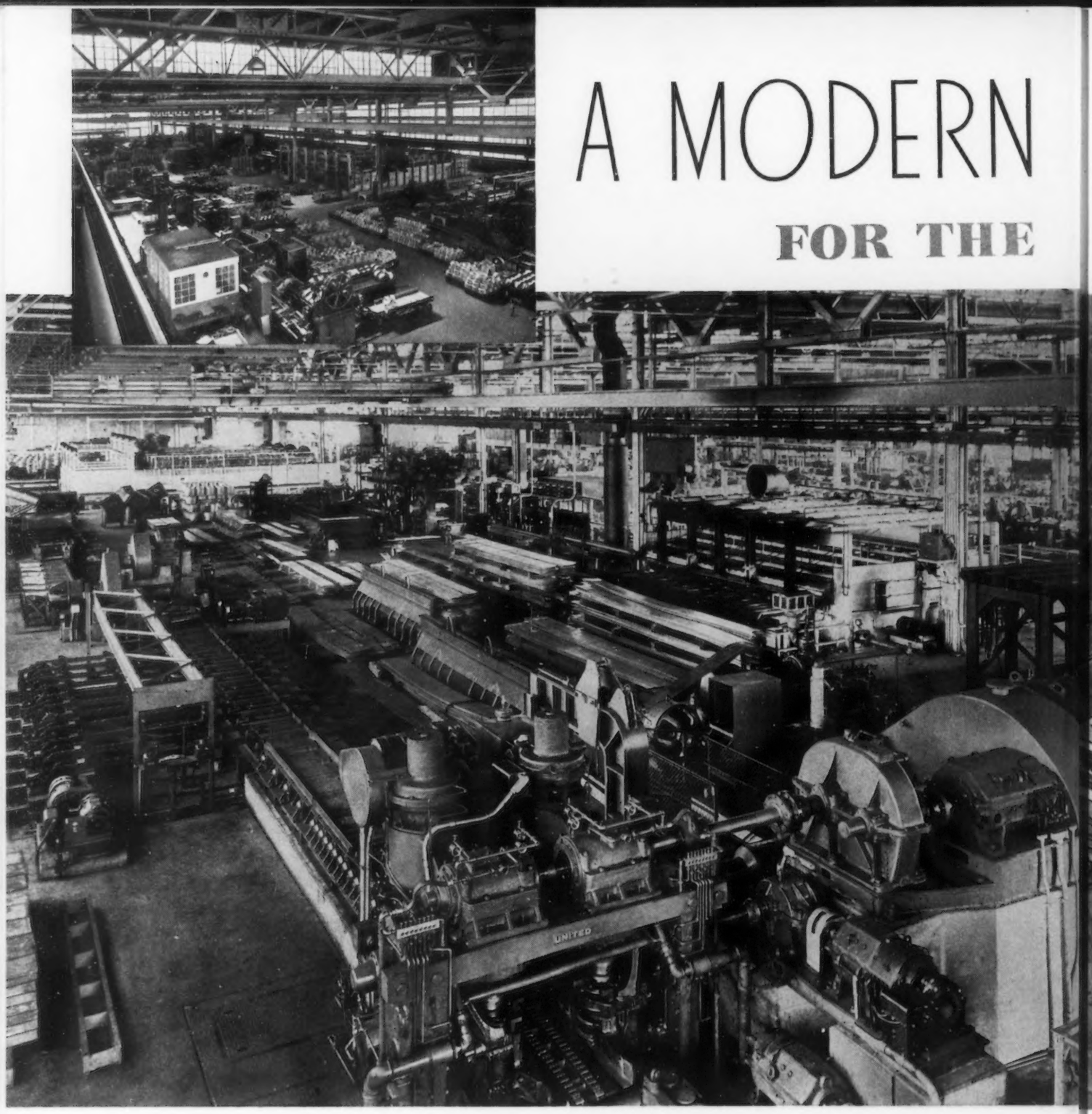
NATCO "HOLEWAY" machines are designed for high production multi-drilling boring and tapping operations . . . are sturdily built to stand up against hard usage over long periods with little maintenance expense.

Write for literature or call a NATCO representative and let him aid you in coming to a practical and economical solution of your "hole" problems.

THE NATIONAL AUTOMATIC TOOL CO.
Richmond, Indiana, U. S. A.
Chicago Office, 2009 Engineering Bldg.
Detroit Office, 409 New Center Bldg.

Investigate NATCO Methods for the Lowest Possible Hole Costs!

NATCO
DRILLING, BORING and TAPPING MACHINES



A MODERN

FOR THE

ALONG stride toward the ideal of straight line production in the rolling of nonferrous metals has been achieved in the new plant of the Bridgeport Brass Company.

This project, with a monthly capacity of more than 6,000,000 pounds, is devoted exclusively to the production of brass, copper and copper-base alloys in sheets, coils and strips.

Two organizations were privileged to cooperate with the engineers of the Bridgeport Brass Company, who had developed the preliminary plans.

On Morgan Construction Company devolved the task of preparing a systematic production layout to insure continuous "straight-line" flow of material from cake to finished product, through hot and cold mills, annealing, pickling, and other processes essential to the correct working of nonferrous metals. This involved planning for maximum utility of all equipment, with locations, capacities and transfer facilities carefully determined to permit flexibility of production and low conversion cost.

To Stone & Webster Engineering Corporation was delegated the task of developing the plans and specifications for buildings for mill and laboratory, with complete power and service facilities; the translation of plans into a plant, efficient and modern in every respect and with adequate provision for expansion; the coordination of all engineering and purchasing activities, supervision of construction, and the budgetary control for the entire project.

The result—a new and far-reaching step in the nonferrous metals industry. For Bridgeport, a modern plant that greatly increases the company's previous rolling capacity.

For the nonferrous metals industry, a new and complete engineering and construction service, combining sound experience and knowledge with vision.

ROLLING MILL PLANT

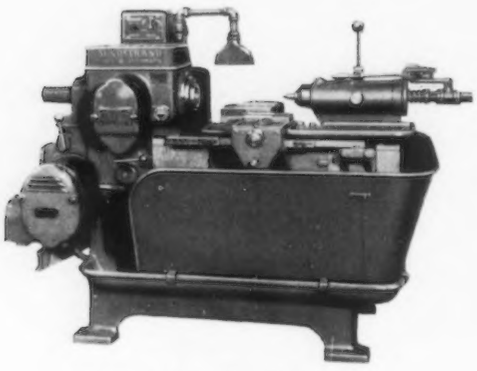
BRIDGEPORT BRASS COMPANY

PLANT . . . plans and specifications for buildings; power and service facilities; coordination of engineering and purchasing; supervision of construction; budgetary control.
STONE & WEBSTER ENGINEERING CORPORATION

EQUIPMENT . . . production layouts; detailed specifications; manufacturers' proposals; foundation designs, etc.; supervision of erection for all equipment.
MORGAN CONSTRUCTION COMPANY

MORGAN CONSTRUCTION COMPANY, WORCESTER, MASS.
STONE & WEBSTER ENGINEERING CORPORATION
BOSTON · NEW YORK · PITTSBURGH · CHICAGO

Sundstrand Automatic Improves Pump Production



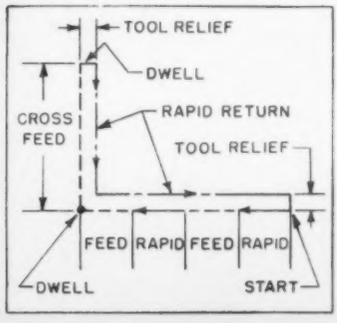
Model 8 Automatic Stub Lathe

Below — Model 8 Sundstrand Automatic Stub Lathe operating on pump bodies. Guard removed to show Front Carriage, including Units for Slow-up and Dwell; also Straight Feed-in.

Rapid Traverse at 250" a minute, Skip Feed, and Feed-In Unit for Front Carriage are standard features of Sundstrand Automatic Stub Lathe shown at left which are specially valuable in improving production on ferrous alloy pump bodies illustrated. Front tools; mounted in indexing tool-block; rough and finish inside as indicated in diagram below. Rear tool rough- and finish-faces open end to close limits with respect to parallel surface.

This work formerly required three machines, three chuckings, three handlings. Standard Model 8 Automatic Stub Lathe does the whole job, saves capital investment, floor space, work handling; improves quality of work, employs cemented carbide tools effectively to increase production . . . and can be set up quickly for many other jobs. *Every time a Sundstrand Automatic Stub Lathe is used on new work, purchase of the finished product becomes easier for a larger number of people.* Investigate! Sundstrand Automatic Stub Lathes, built in three sizes, have enormous possibilities. Ask us about them for your work.

SUNDSTRAND MACHINE TOOL CO.
2539 Eleventh Street, ROCKFORD, ILLINOIS, U. S. A.



Hydraulic Clamping—A Sundstrand Hydraulic Clamping Unit provides easily operated, fast, powerful, dependable clamping of work-pieces which locate accurately in the Sundstrand-built fixture.

RIGIDMILS - STUB LATHES
Tool Grinders - Drilling and Centering Machines
Hydraulic Operating Equipment - Special Machinery

Off—

★ *These screws of cold rolled bar stock are threaded a distance of 19¾", cut off, chamfered, knurled at one end and a number 0 hole is drilled ⅝" deep. The two operations require 1 minute and 40 seconds and 1 minute and 30 seconds respectively.*

COMES 47% OF MACHINING COSTS

The 47% saving was made on a new Gisholt No. 4 Universal Turret Lathe equipped with the Gisholt speed selector. This is a great time saver because while one cut is in progress, the operator can select and pre-set the spindle speed for the next cut. The pre-set speed is then obtained by touching a trip and the machine automatically makes the shift. There is no loss of time.

The "pre-setting" of spindle speeds is only one of the three ways in which the Gisholt "Speed Selector" can be used. *For full information, ask a Gisholt field engineer or write us.*

Gisholt "Speed Selector"

The most efficient control ever devised for the purpose. Operator sets dial to diameter of the cut and the machine automatically responds with the most efficient cutting speed, whether it's for turning, facing and boring. A touch of the high-low trip immediately provides proper reaming or threading speed. Available on Gisholt Nos. 3, 4, and 5 Ram Type Universal Turret Lathe. Literature will be sent on request.

GISHOLT

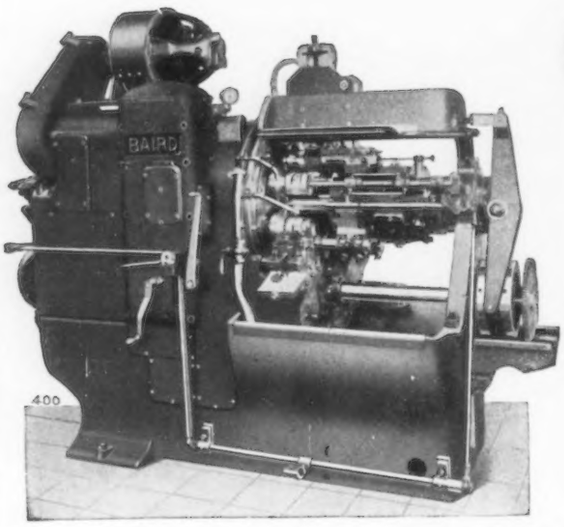
GISHOLT MACHINE COMPANY

1215 EAST WASHINGTON AVENUE, MADISON, WISCONSIN, U. S. A.

TURRET LATHES · AUTOMATIC LATHES · TOOL GRINDERS · BALANCING MACHINES

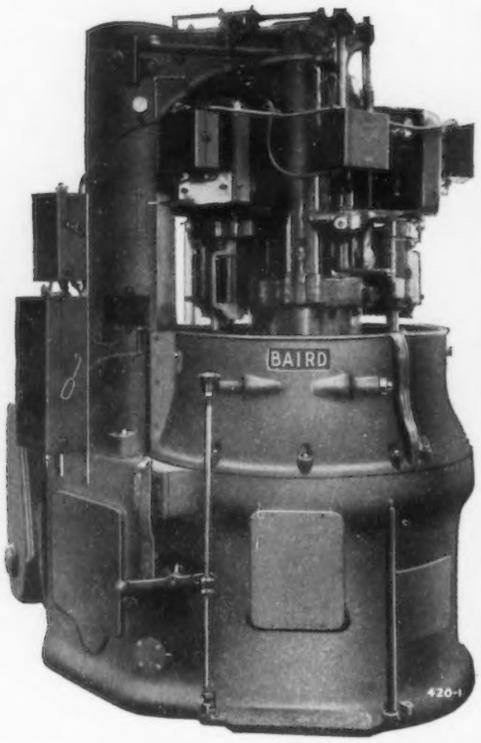
ACCURATE – SPEEDY PRODUCTION MACHINES BY

AUTOMATIC BAIRD MACHINE CO. BRIDGEPORT, CONN. MACHINERY



This picture shows a **BAIRD 7" SIX SPINDLE HORIZONTAL AUTOMATIC LATHE.**

The machine may be arranged for chucked work or for work to be turned on centers and with or without one or more cross slides as well as the five longitudinal tool slides for ordinary turning operations and also arranged to drill one or more holes or to mill or thread or tap and to include a sandpapering or buffing operation and loading and unloading devices, **AS THE JOB REQUIRES.**



This picture shows a **BAIRD 11" EIGHT SPINDLE VERTICAL AUTOMATIC INTERNAL GRINDER.**

At each station a wheel is provided of the size, grade and speed best for the work to be done at each station.

Each wheel is independently dressed and sized or positioned at each cycle and only according to the need of each, hence least cost for wheels.

Work having two diameters may have wheels arranged for both.

BOTH OF THESE BAIRD MACHINES

Have Automatic Controls,

REQUIRE LEAST WORK BY OPERATOR.

Have Spindle Speeds and Tool Feeds best for each part of each job.

Have Mechanical Chucks requiring neither fluid nor air.

BAIRD Mechanical Chucks have a Maintained, Adjustable Gripping Pressure, a very important point as it practically eliminates the chance of work becoming loose in the chucks.

Have Totally Enclosed Mechanism with Forced Feed Lubrication and High Speed yet Smooth Indexing so that production time is reduced to a minimum.

May be set up **DOUBLE-INDEXING** which permits of a piece of work being finished from both ends by being passed through the machine a second time but in a continuous operation.

This **BAIRD PATENTED TURN - AROUND METHOD** can be used on the **BAIRD GRINDER** to grind from both ends of the work and different diameters if so wanted.

Double Indexing also allows of two pieces of the same work being loaded and unloaded at each cycle, the two pieces being operated on in the same way at the same time.

These methods save handling, floor space, storage, &c., and help in the checking of the work.

"Ask Baird About It"

THE BAIRD MACHINE COMPANY

BRIDGEPORT, CONN.

POTTER & JOHNSTON IN AIRCRAFT MANUFACTURE

Greater Production With Less Fatigue

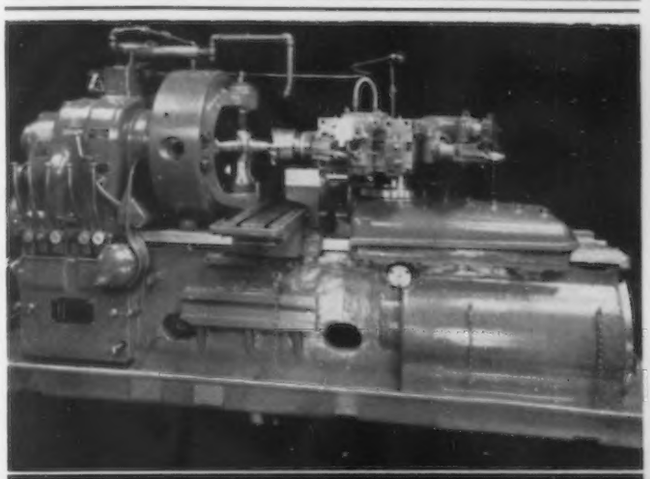
Divided Labor Costs

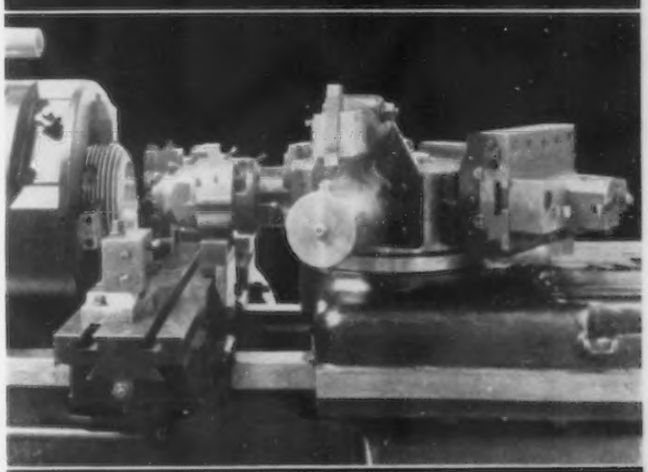
Extreme Accuracy.

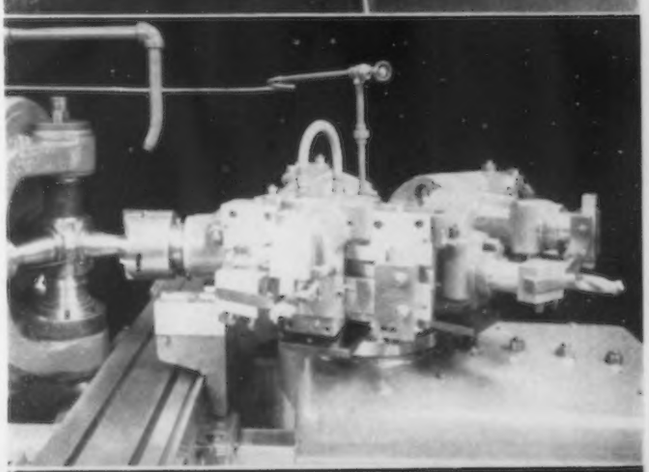
When confronted with problems involved in the manufacture of AIRPLANE ENGINES and PROPELLERS make use of the knowledge of the subject possessed by P. & J. engineers. More often than not these problems include a combination of alloy steels—large amounts of stock to remove—many involved operations on one piece—high hardness readings—unusually close limits of accuracy—extremely fine finish requirements—all of which call for not only a versatile and economical machine tool but also considerable cooperation between the manufacturer and the machine tool builder. P. & J. Automatics have proven outstanding for solving the problems for this class of work. They are especially designed for high production, with extremely flexible tooling facilities.

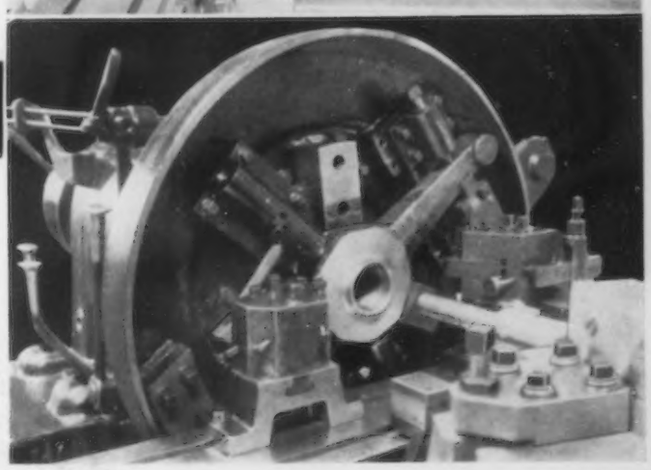
The Aircraft Industry offers much evidence of cooperation between the manufacturer and the P. & J. engineering department in the matter of tooling, etc., which is discernible in the photographs on this page. They have been selected from our Pratt & Whitney Aircraft and Hamilton Standard Propeller files.

Send us your prints for full information.





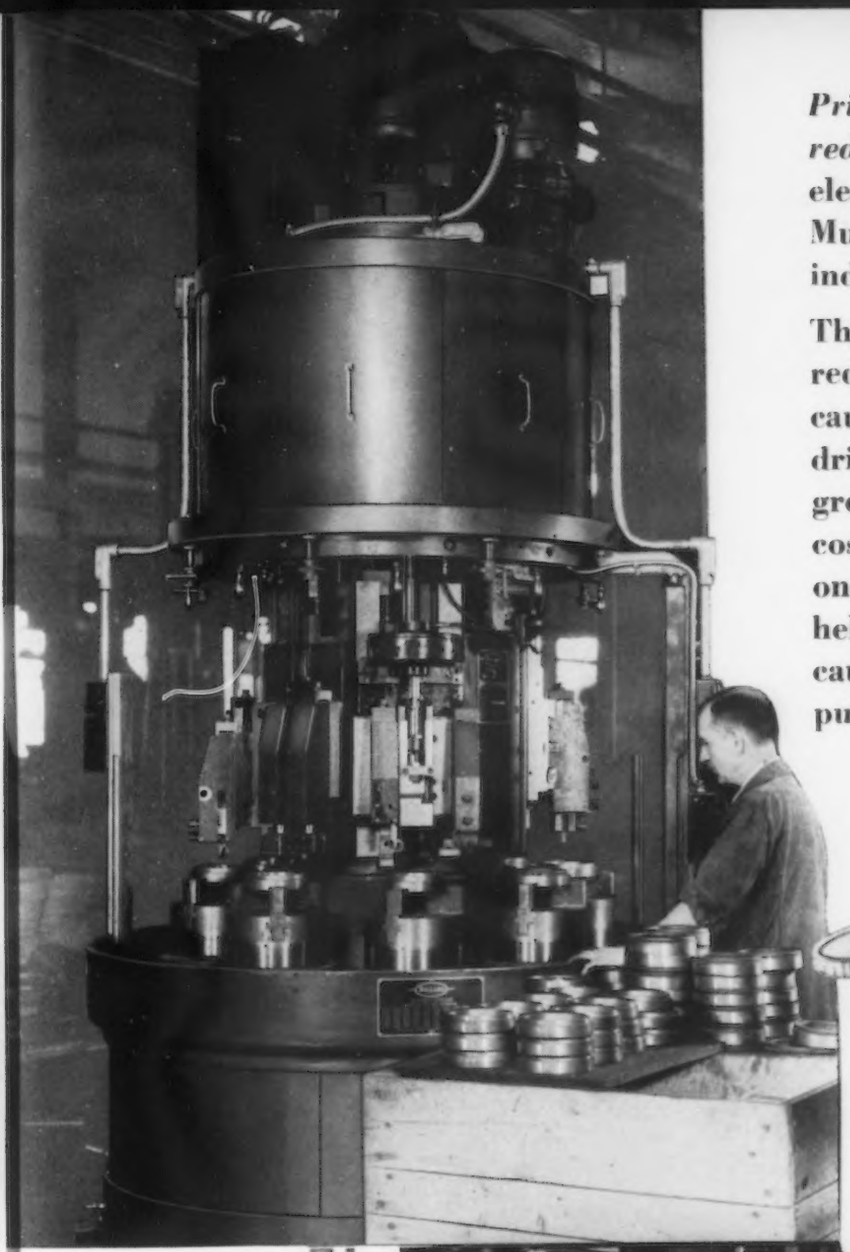




POTTER & JOHNSTON MACHINE CO.
Pawtucket, R. I., U. S. A.

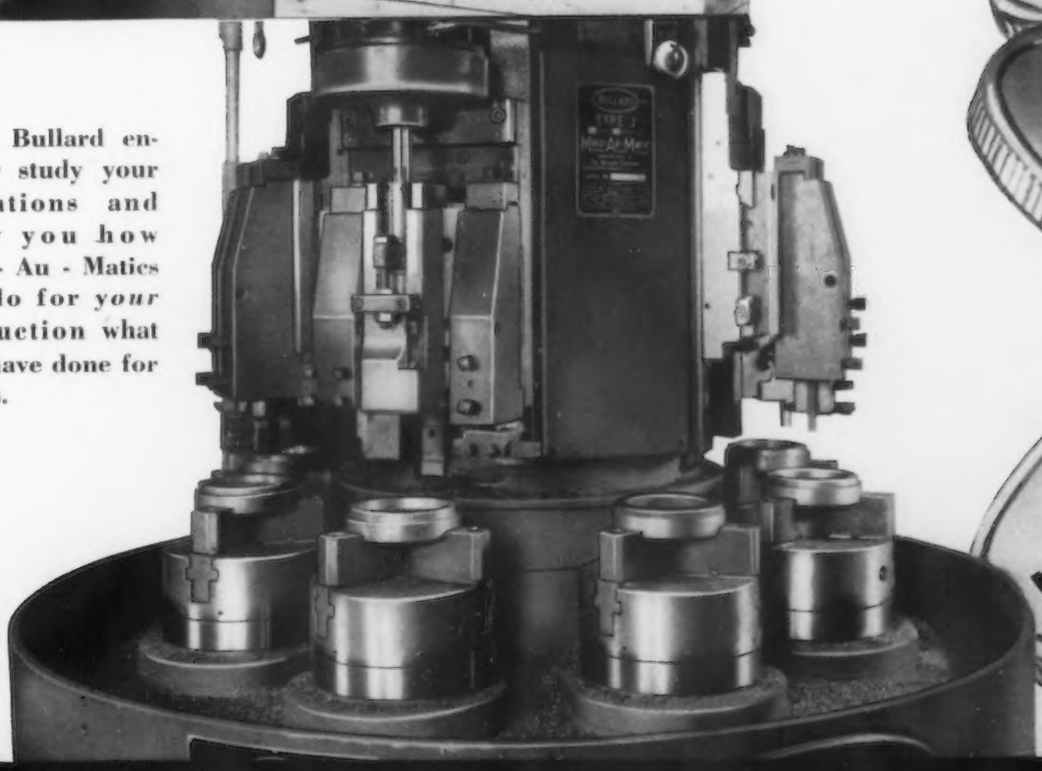
FACTORY REPRESENTATIVES:

William L. Martin, Headquarters at Factory: New England States and Eastern New York & New Jersey: A. W. Stone, 986 Kenyon Ave., Plainfield, N. J.; Western New York & New Jersey, Eastern Pennsylvania, Maryland and Delaware; G. Tell DuBois, 8-154 General Motors Building, Detroit, Michigan; Michigan and the City of Toledo, Ohio; Louis K. Voelk, 14014 Woodworth Road, East Cleveland, Ohio; Ohio—with the exception of Toledo, and Western Pennsylvania; Harry L. Schuster, 743 North Fourth Street, Milwaukee, Wisconsin; Illinois, Missouri, Wisconsin, Iowa and Indiana. **AGENCIES:** Star Machinery Company, 1741 First St., South, Seattle, Washington; Henes-Morgan Machinery Co., 2026 Santa Fe Ave., Los Angeles, Calif.; Jenison Machinery Co., 20th & Tennessee Sts., San Francisco; Wessendorff, Nelms & Co., Inc., 317 Preston Ave., Houston, Texas; Arthur Jackson Machine Tool Co., 60 Front Street West, Toronto 2, Ontario, Canada; Arthur Jackson Machine Tool Co., 437 Grosvenor Ave., Montreal, Canada; Burton, Griffiths & Co., Ltd., Birmingham, England; R. S. Stokvis et Fils, Paris, France; Rotterdam, Holland; and Brussels, Belgium; Maskinaktiebolaget Karlebo, Stockholm 1, Sweden; Ing. Ercole Vaghi, Milano, Italy; Yamatake & Co.; Ltd., Tokyo, Japan (Imperial Export Co., 44 Whitehall St., New York, N. Y.); Almacoa, Zurich, Switzerland; Be-Te-Ha, Warchau, Poland; Schuchardt et Schutte, Budapest, Hungary; Bourla Freres, Istanbul, Turkey.



Price reduction, made possible by *cost reduction*, created the automotive and electric appliance industries. Bullard Mult-Au-Matics are widely used in these industries.

The connection? Mult-Au-Matics are cost reducing machines. They are *bought* because Mult-Au-Matics bore, face, turn, drill, ream, and thread faster with greater sustained accuracy and at lower cost than other methods can permit, even on runs as short as 250 pieces. They help create thousands of new jobs because they help bring prices within the public's reach.



Let a Bullard engineer study your operations and show you how Mult - Au - Matics can do for *your* production what they have done for others.

THE BULLARD COMPANY

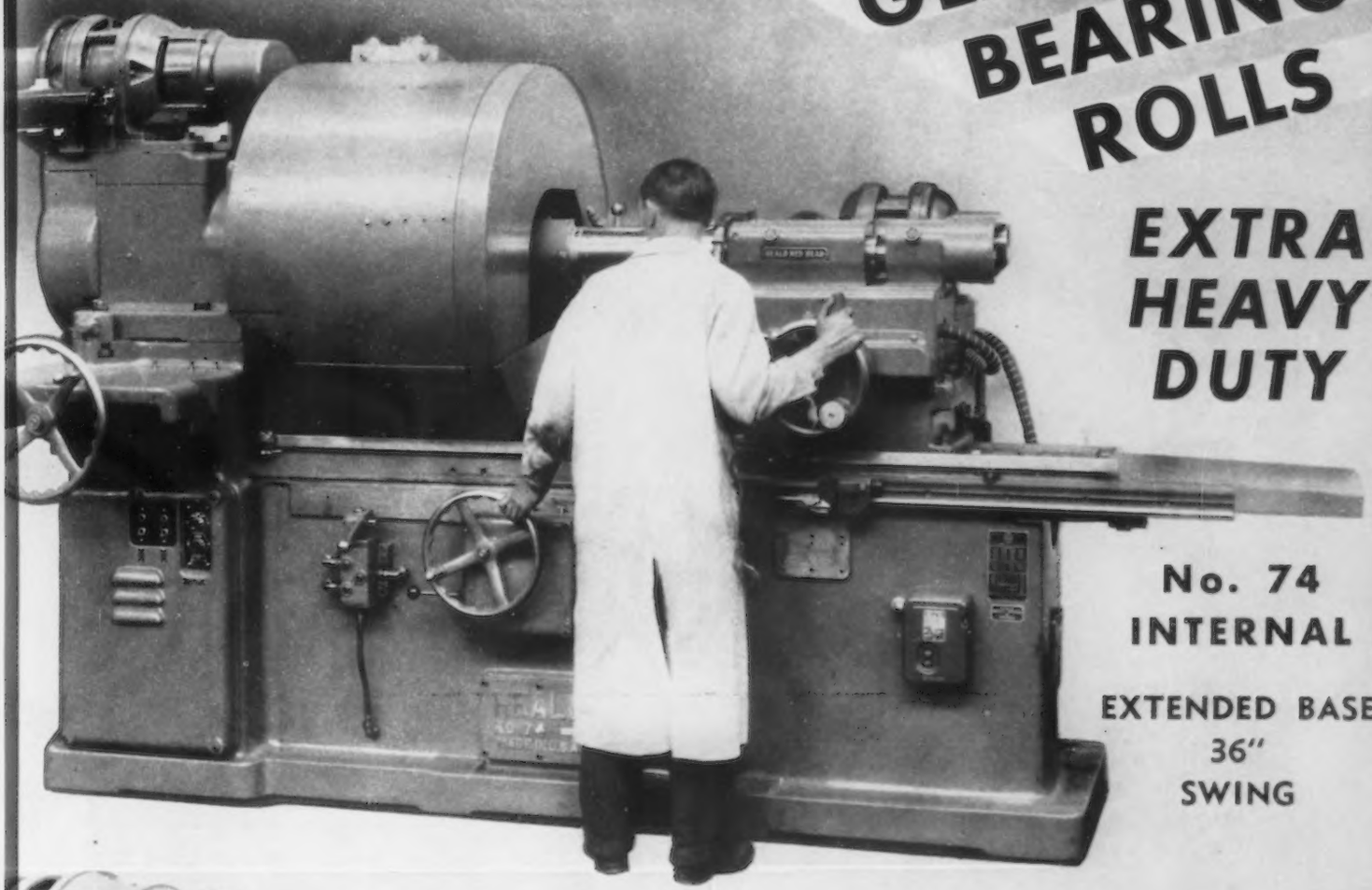
BRIDGEPORT, CONNECTICUT

for

LARGE

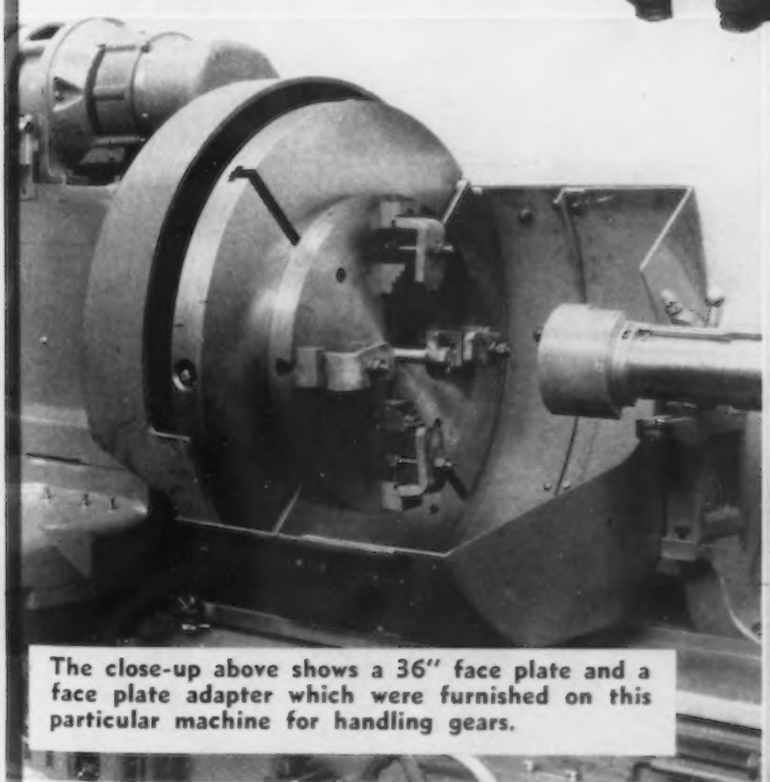
GEARS BEARINGS ROLLS

EXTRA HEAVY DUTY



No. 74 INTERNAL

EXTENDED BASE 36" SWING



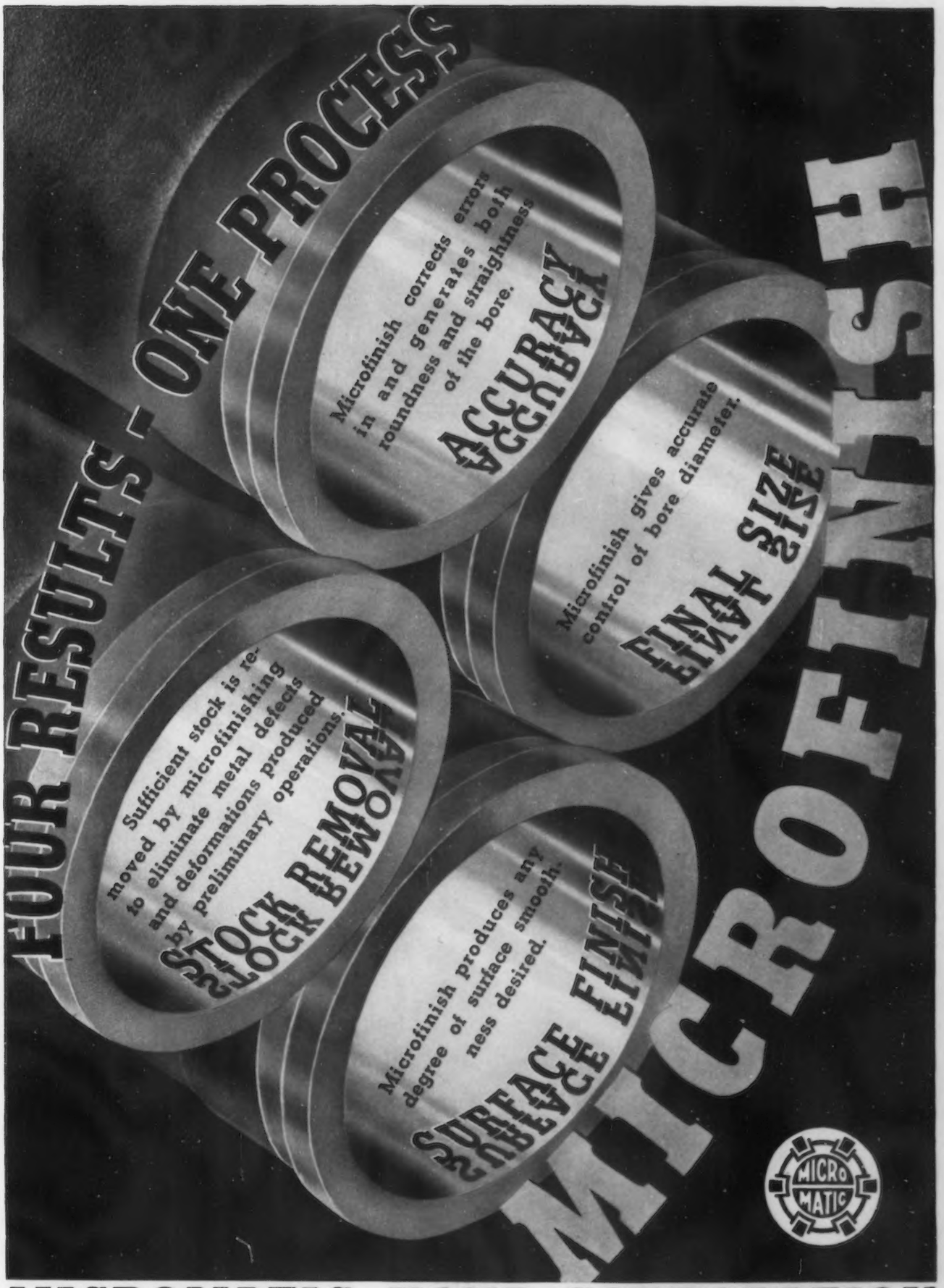
The close-up above shows a 36" face plate and a face plate adapter which were furnished on this particular machine for handling gears.

Large gears, bearing races, rolls and similar work requiring swing clearance up to 36" are readily handled on the Heavy-Duty Heald No. 74 Internal Grinding Machine. This machine has an extended base 18" longer than the standard No. 74 and is equipped with a special oversize workhead designed for heavy-duty operation.

In addition to a swing capacity of 36" within the water guard, the workhead can be swiveled up to 30° for grinding taper holes. A hand wheel operated cross-slide under the workhead and hand wheel table feed are also provided, which permit face grinding as well. An hydraulically operated water guard swings upward allowing convenient loading from overhead with a crane.

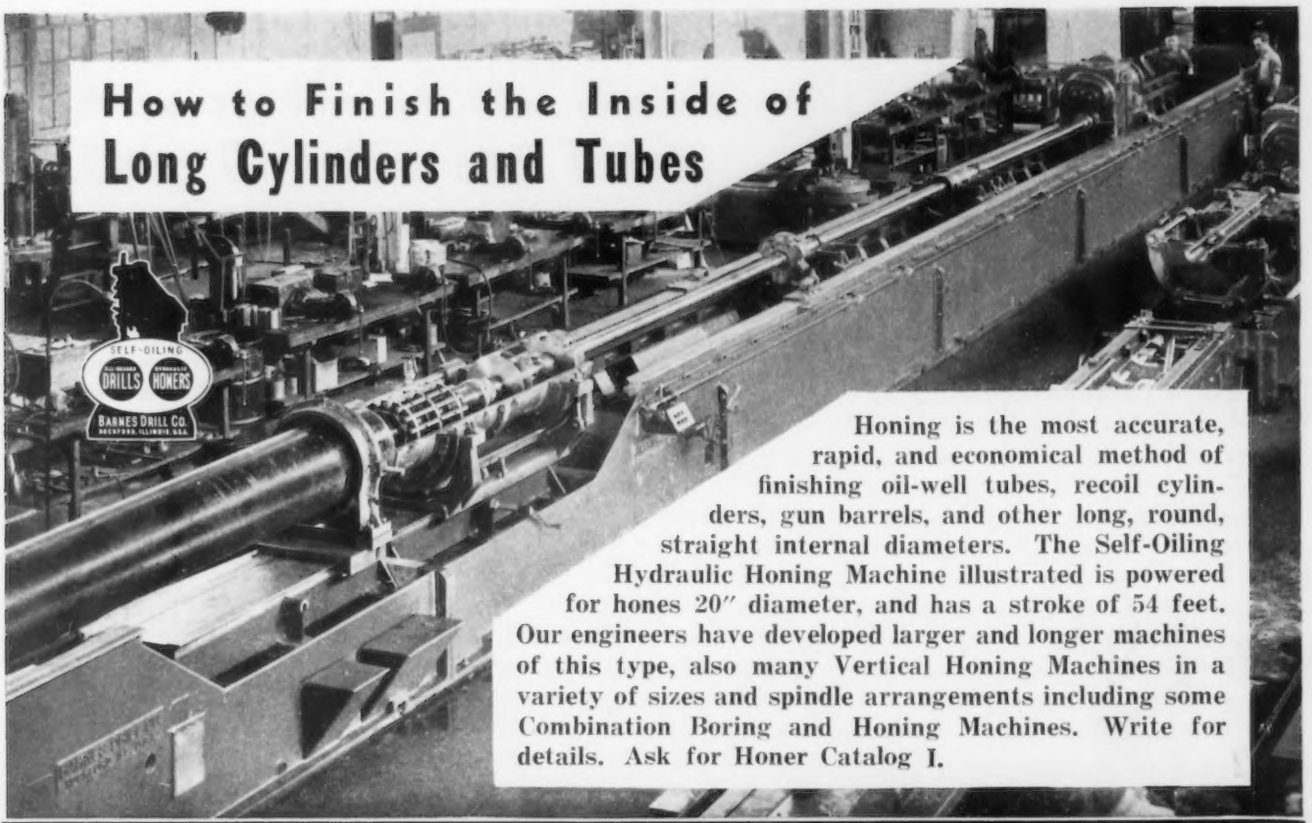
THE HEALD MACHINE CO., WORCESTER, MASS., U.S.A.

Use a Heald for **PRECISION · PRODUCTION · PROFIT**



MICROMATIC HONE CORPORATION

7401 DUBOIS STREET - - - DETROIT, MICHIGAN

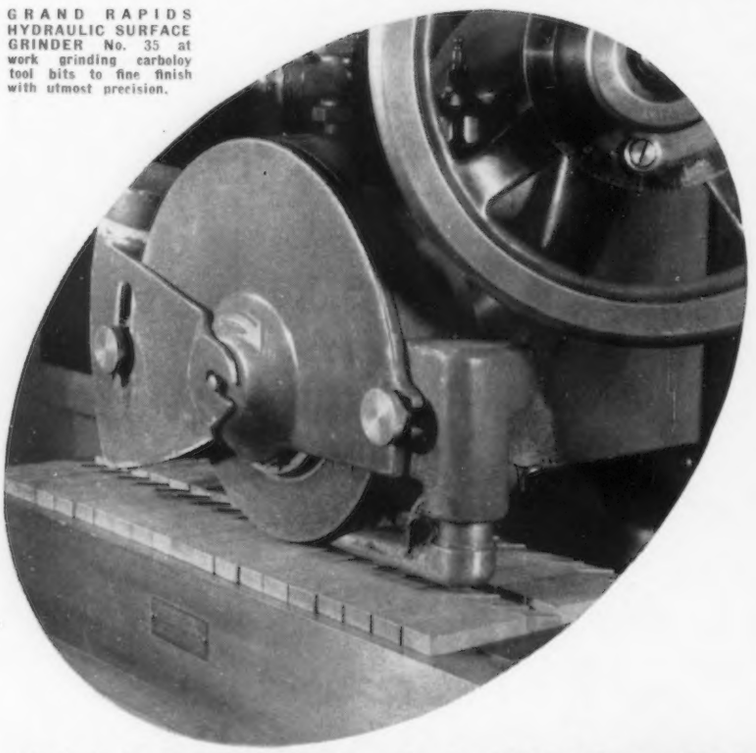


How to Finish the Inside of Long Cylinders and Tubes

Honing is the most accurate, rapid, and economical method of finishing oil-well tubes, recoil cylinders, gun barrels, and other long, round, straight internal diameters. The Self-Oiling Hydraulic Honing Machine illustrated is powered for hones 20″ diameter, and has a stroke of 54 feet. Our engineers have developed larger and longer machines of this type, also many Vertical Honing Machines in a variety of sizes and spindle arrangements including some Combination Boring and Honing Machines. Write for details. Ask for Honer Catalog I.

BARNES DRILL CO. 815-831 CHESTNUT STREET
ROCKFORD, ILLINOIS, U. S. A.

ON THE JOB . . . . *Where the Going is* TOUGH



GRAND RAPIDS HYDRAULIC SURFACE GRINDER No. 35 at work grinding carboloy tool bits to fine finish with utmost precision.

GRAND RAPIDS HYDRAULIC FEED SURFACE GRINDERS

Every machine in the GRAND RAPIDS LINE, offers these among many other advantages: easy accessibility to hydraulic assembly from front or rear—extreme accuracy and fine finish at maximum longitudinal table speeds—elimination of oiling time. This grinder has the smooth high speed that you need to do the finest accurate work.

Send for the new catalog GL-100 illustrating the latest in hydraulic feed surface grinders.

GALLMEYER & LIVINGSTON CO. 303 STRAIGHT AVENUE, S. W.
GRAND RAPIDS, MICHIGAN

Industry Profits by Research

Research is the corner-stone of modern industry today.

Those who have had an opportunity to visit the Norton Worcester plant have marveled at the research facilities available—the staff of over 50 trained scientists and technicians—the thirteen well equipped laboratories covering such special subjects as analytical chemistry, organic chemistry, physical chemistry, ceramics, mechanics, petrographics, and polishing abrasive development and application.

In the extensive laboratories at the Norton electric furnace plant in Chippawa a large research staff is also constantly at work on new abrasive developments and checking the raw materials used in abrasive manufacture.

The past years have seen many important developments* come from these Norton laboratories. They have solved difficult grinding problems for many — have reduced grinding costs for all. And countless developments of importance are sure to come in the future.

Industry has profited and will continue to profit by Norton research.

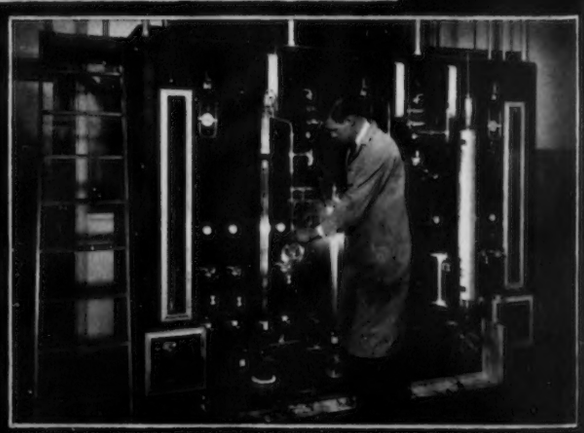
*Just to name a few recent ones: optical synthetic resins, diamond wheels including the new metal bond, "I-R" Crystolon abrasive, "B-E" bond, controlled structure, Norbide (Norton boron carbide).

The greater part of the research laboratories at Worcester (about 37,000 square feet) is located in this building, designated as Mill 7.

Measuring the musical pitch or "ring" of a wheel in the Physical Chemistry Laboratory to determine certain of its characteristics.

The Mechanical Laboratory is the proving ground where wheels are tried under shop conditions and under special test conditions.

The careful checking and testing of raw materials is an important function of the Analytical Laboratory.



This still panel in one of the Organic Chemistry Laboratories is used in research on synthetic resins.

NORTON ABRASIVES

NORTON COMPANY · WORCESTER, MASSACHUSETTS, U. S. A.

NEW YORK · CHICAGO · DETROIT · CLEVELAND · PITTSBURGH · PHILADELPHIA · HARTFORD
HAMILTON, ONT. · LONDON · PARIS · WESSELING, GERMANY · CORSICO, ITALY

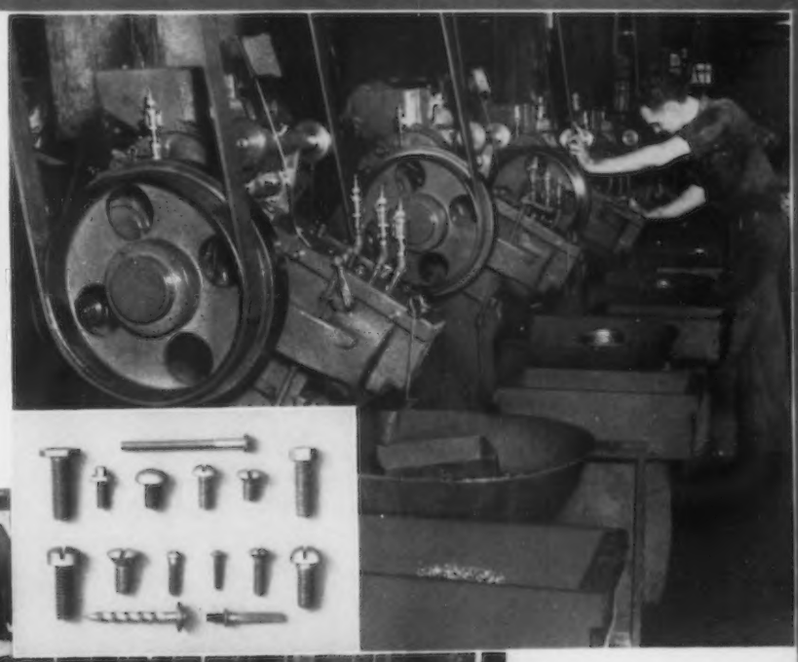
Norton sharpening stones marketed by BEHR-MANNING DIVISION, TROY, N. Y., manufacturers of abrasive paper and cloth

Norton and Behr-Manning products are distributed through leading mill supply houses

Machine Screws

By the million

Each machine in this battery of Waterbury-Farrel Automatic Screw Thread Rollers will do more than 1,000,000 No. 10 machine screws a month. Automatic Threaders up to and including ¾" thread diameter; Hand Feed Machines up to and including 1".



The last word in high speed cold heading—a group of Waterbury-Farrel "Hi-Pro" double blow headers. Production: For 3/16" wire, 225 per min.; for 5 16" wire, 175 per min.

Produced on WATERBURY - FARREL COLD PROCESS SCREW MACHINERY *at the* CENTRAL SCREW CO., PLANT

FOUNDED WATERBURY FARREL 1851

This progressive Mid-West concern is well-equipped to meet the demands of

THE WORLD OF TOMORROW

Unequalled Quality — Economy — High Production

Rolled Thread Machine Screws are the strongest and finest commercial product obtainable!

WATERBURY FARREL FOUNDRY & MACHINE COMPANY

WATERBURY • CONNECTICUT • U·S·A

CHICAGO CLEVELAND NEWARK, N. J.

IT STARTED IN THE AIRCRAFT INDUSTRY WITH CYLINDER STUDS!

Now grinding is top ranking production method for generating threaded parts

HOW can we put better, stronger threads on our highly stressed cylinder studs? That was the cry of the aircraft industry only a few years ago. They had already reached the absolute limit of accuracy and dependability in generating threaded sections by the old methods.

The answer was thread grinding! With the introduction of accurate and efficient machines in 1935, it became possible for the first time to generate cylinder stud screw threads from the blank by grinding . . . on a production basis. Previous to this, thread grinding had been an obscure process used only for the correction of screw threads.

Thread grinding provides the accurate size and perfect finish necessary for the high factor of safety required in aircraft engine parts such as these rocker arm bolts.

The result of grinding the cylinder stud threads was a vast improvement in accuracy and dependability . . . at a surprisingly low cost. The new method was so sensationally successful that its use was soon extended by aircraft manufacturers to practically all threads on external surfaces, and to internal surfaces where size would permit.

Clutch barrels and related parts are ground to meet requirements for extreme accuracy.

Manufacturers in other fields were not slow to fall in line. They have eagerly adopted thread grinding and made it one of the top ranking production methods for generating threads of all kinds . . . in a wide variety of materials . . . for almost every conceivable purpose.

Grinding was used to make this tapered plug gauge for internal pipe threads.

Thread grinding has many advantages

No wonder thread grinding was enthusiastically received. It gives a highly accurate thread section, with a smoother, better finish and appearance. The thread is stronger and more dependable. There is almost a complete absence of checks and cracks. And because the grinding is done after heat treating, the threads are unusually hard and wear resistant.

These advantages are gained with no sacrifice in economy. Production is rapid and the cost low. For a given degree of accuracy, many thread pitches may be produced from the blank in a fraction of the time required to mill or turn the same threads. No special skill or experience is required by the operator.

Any material can be threaded by grinding

Any material, metallic or non-metallic, which can be ground can also be threaded by means of special thread grinding wheels and thread grinding machines. The advantages of the process are particularly outstanding on the threading of corrosion, heat and abrasion resisting alloy steels;

Thread grinding is simple. Accurate results are secured without experienced operators.

and on those materials with abrasive qualities like hard rubber, hard fibre, hard baked carbon, and moulding compounds (especially those containing fillers like mica dust).

Correct grinding wheels necessary for best results

As in all precision grinding, the use of the right wheel is of paramount importance in thread grinding. Even before the appearance on the market of thread grinding machines for production work, Carborundum had discovered and introduced the modern types of specially bonded thread grinding wheels. This availability of suitable wheels had a great deal to do with the immediate success of thread grinding on a production basis.

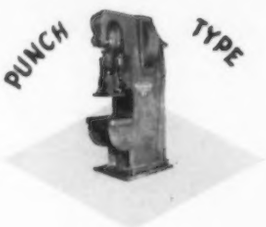
Adequate stocks of uniform, high-quality Carborundum-made thread grinding wheels are carried at all times, to meet every thread grinding requirement from 2 to 80 threads per inch. And Carborundum's wide

Strong, accurate threads are ground with Aloxite Brand Resinoid and "AA" Aloxite Brand Vitrified Wheels manufactured by The Carborundum Company.

experience in thread grinding is available at once to any manufacturer who is interested in a further investigation of the advantages of this revolutionary process. Inquiries will be welcomed at any office of The Carborundum Company.

Modern Power Presses Increase Production AND EMPLOYMENT

The Power Press of today is no longer considered just a heavy



piece of machinery arranged with cumbersome and unsightly overhanging outboard brackets. — It

is a MODERN Machine Tool of neat, compact appearance designed to meet the present day production requirements of the Pressed Metal Industry. — When built to conform to modern engineering standards of design and con-

struction it embodies greater strength and ruggedness with greatly reduced weight. — Furthermore, MODERN design permits of many improvements in operating efficiency.

— In many instances gears are completely enclosed and run in a bath of oil. — Wherever possible, shafts have been made shorter in order to eliminate undue torsional strain. — Sensitive and safe, air and hydraulic clutches located between the uprights contribute to improved stability, which is especially necessary with increased speeds. — These, and many more, recent developments show the trend to Modernization which is enabling alert Pressed Metal Manufacturers to lower both their costs and their

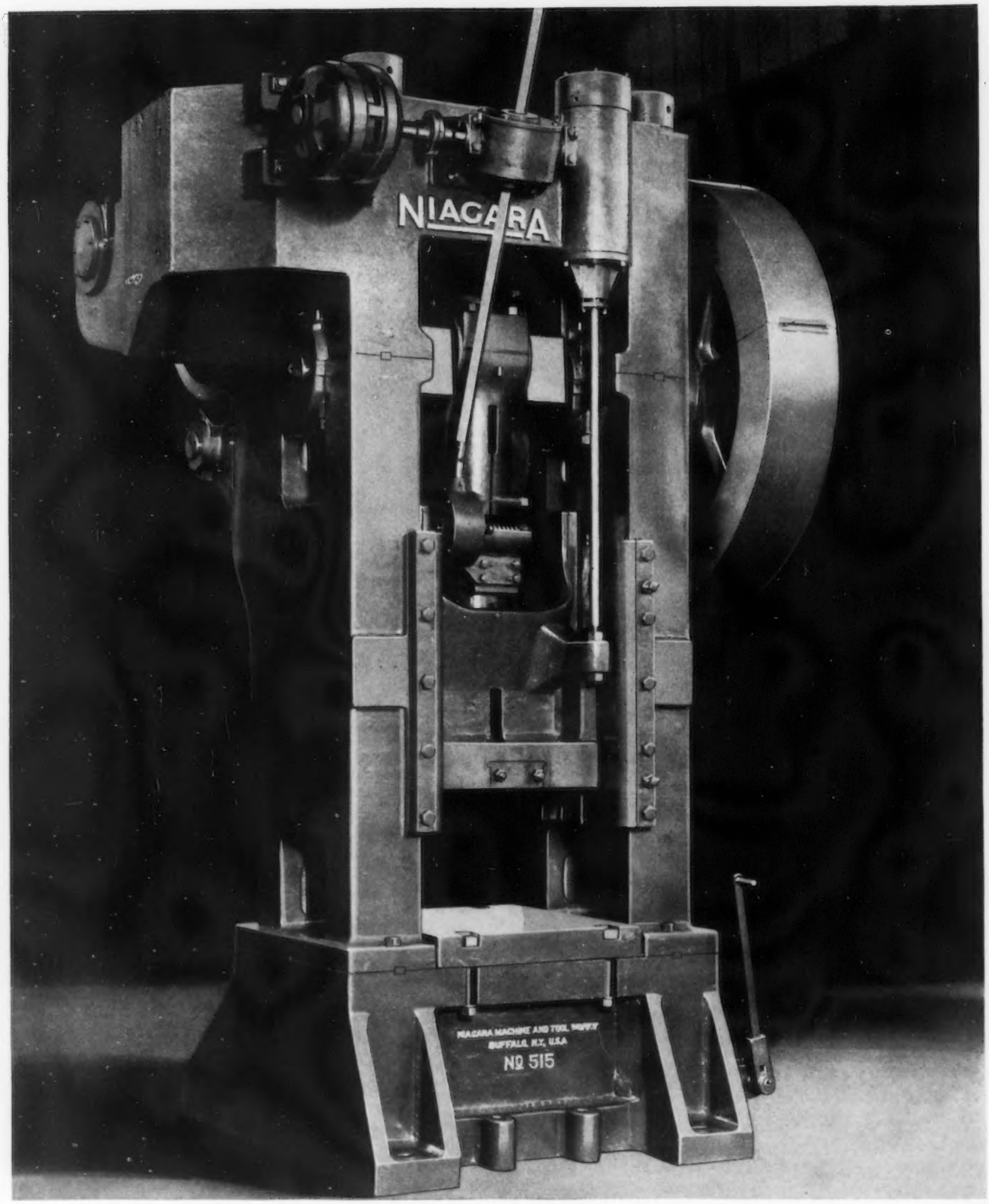
selling prices thereby broadening their profitable field of sales and adding a great many hours of gainful employment to the mutual advantage of Employer and Employee. — That Cleveland Presses are playing a leading role in bridging the gap between supply and demand in the Pressed Metal Industry is evidenced by the constantly increasing number of Clevelands which are being shipped to Manufacturers everywhere.

If you are interested in Modern Power Presses we will be pleased to send you a copy of a recently published book which illustrates each of the eleven different types of Cleveland Power Presses.

Modern Presses **THE CLEVELAND PUNCH & SHEAR WORKS COMPANY** *Cleveland, Ohio*

NEW YORK • CHICAGO • DETROIT • PHILADELPHIA • PITTSBURGH


PROFITABLE
PRECISION TOOLS—
New Catalog 33
should be your buying
guide—ask for copy.
Brown & Sharpe Mfg. Co.
Providence, R. I., U. S. A.
BROWN & SHARPE
SMALL TOOLS
Catalog No. 33
B·S
BROWN & SHARPE
TOOLS

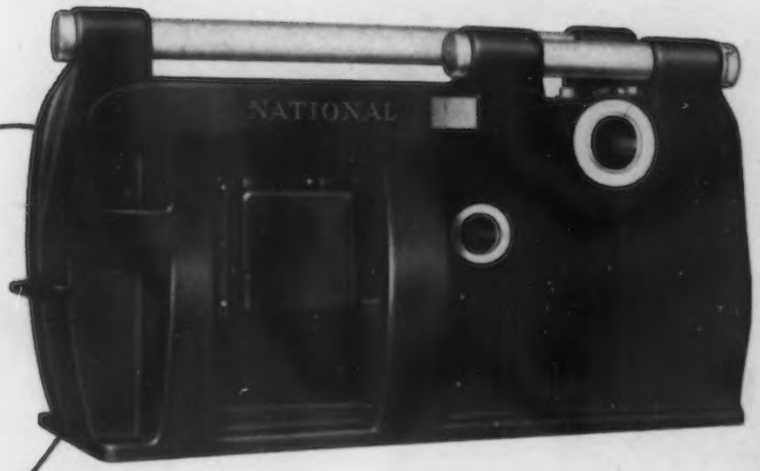


One of the complete line of Niagara Single Crank Presses built in a wide range of sizes and capacities for concentrated pressures required in heavy punching, shearing, blanking, trimming, forging, bending, drawing and embossing operations.

NIAGARA MACHINE AND TOOL WORKS, BUFFALO, N. Y., U. S. A.

Branches: General Motors Bldg., Detroit Leader Bldg., Cleveland 50 Church St., New York City

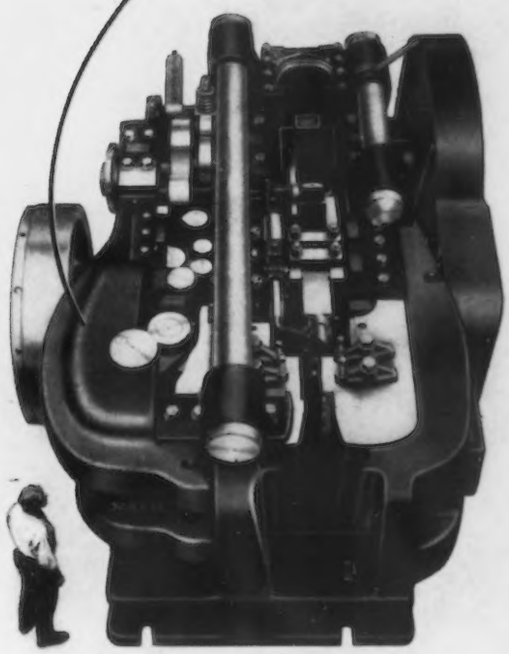
SINCE 1919



THE

UNDER-SLUNG BED FRAME

For Stiffness and Accuracy

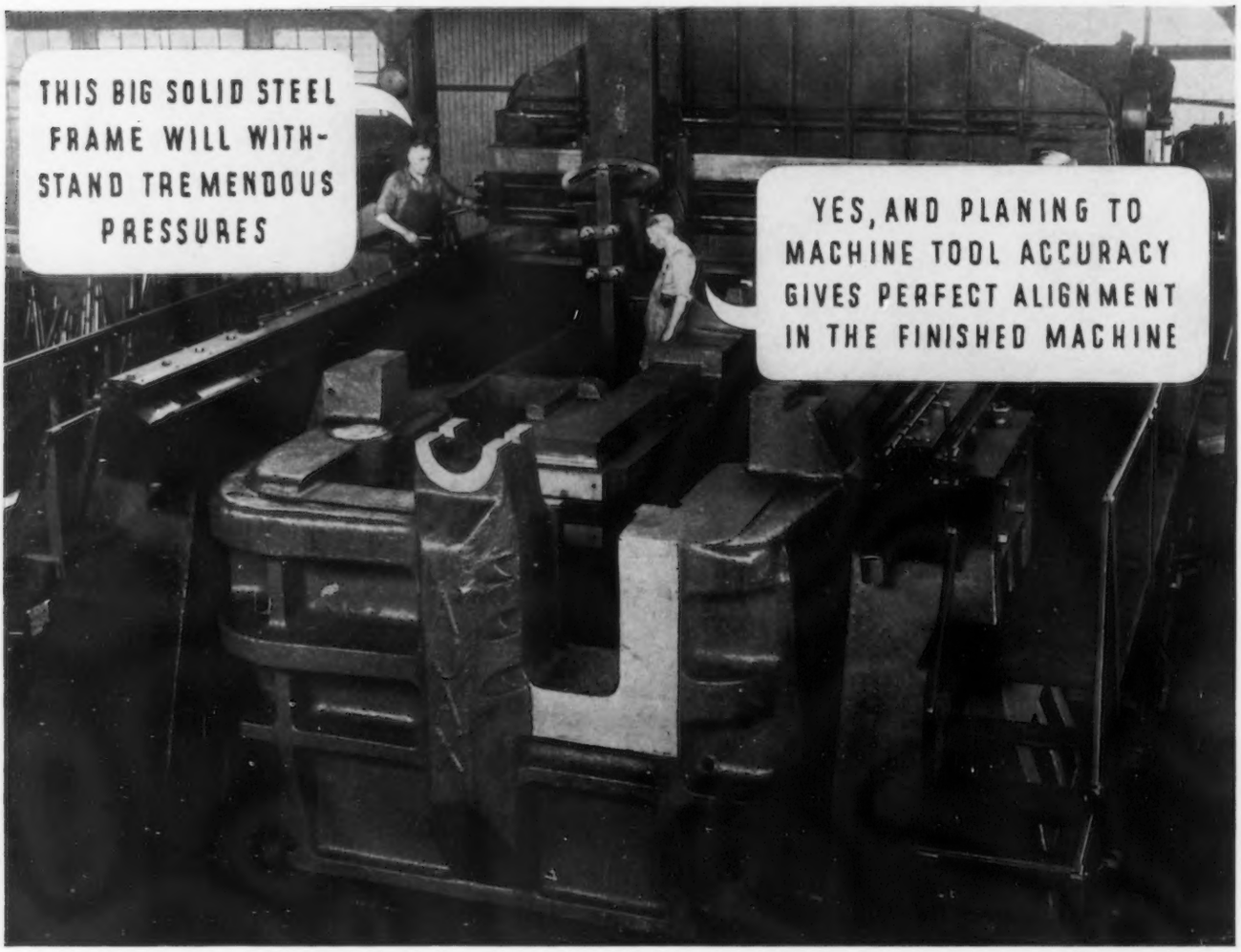


HAILED as a major engineering accomplishment when first announced by National twenty years ago, this type of compact Frame forms the foundation upon which all subsequent improvements in Forging Machine accuracy have been built.

Without this basic idea for rigidity present-day forging demands would be impossible to attain.

NATIONAL
MACHINERY COMPANY
TIFFIN, OHIO.

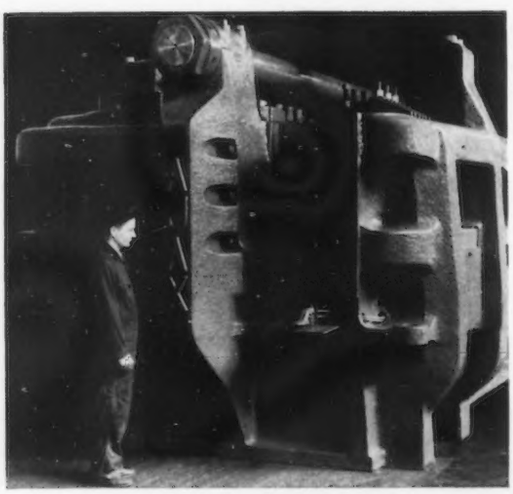
New York Detroit Chicago



THE ONE-PIECE SOLID STEEL BED FRAME

is the Foundation for the Extreme Accuracy of AJAX

Air Clutch Forging Machines



• All standard sizes of Ajax Forging Machines, even the huge seven inch, are built with one-piece, solid steel bed frames to withstand the tremendous pressures of gripping and heading with unyielding, anvil-like rigidity.

There are no hollow ribs and no deceptive box cores to convey erroneous appearance of strength. The walls and ribs are solid and are logically located for soundness in casting and stiffness in service.

The full advantage of this extreme frame rigidity is utilized through the excellent alignment of the extension guided header slide and outboard guided die slide for the production of accurate forgings requiring minimum machining.

Write for Bulletin No. 65-A

THE AJAX MANUFACTURING COMPANY

621 Marquette Bldg.
Chicago, Ill.

EUCLID BRANCH P. O.
CLEVELAND, OHIO

201 Dewart Bldg.
New London, Conn.

22 STROKES PER MINUTE

Twenty-two short working strokes a minute, a complete cycle in a little less than 3 seconds —this is the kind of press performance you need to boost production and lower unit costs.

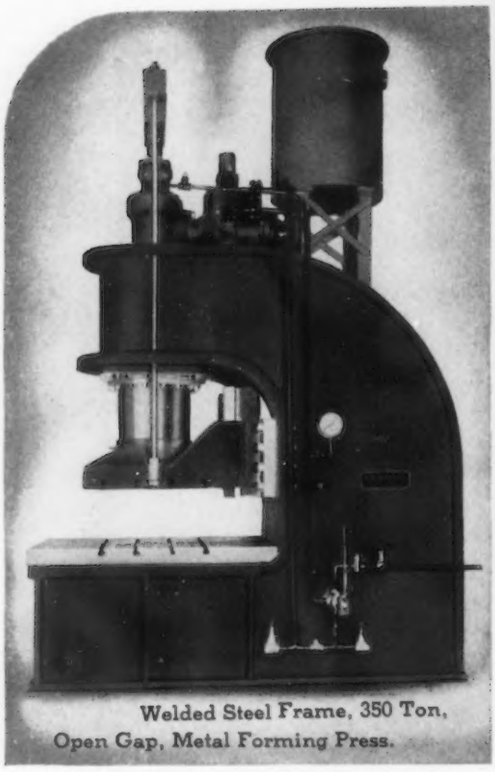
Completely new, this 500 ton Southwark single-acting hydraulic press has a 48-inch by 41-inch platen area and a full stroke of 20-inches. You'll find it difficult to beat for speed of operation, accuracy of work, and sheer simplicity of design.

Whatever your press requirements, Southwark can help you do a better job—more economically . . . BALDWIN-SOUTHWARK CORPORATION, Southwark Division, Philadelphia; Pacific Coast Representative, The Pelton Water Wheel Company, San Francisco.

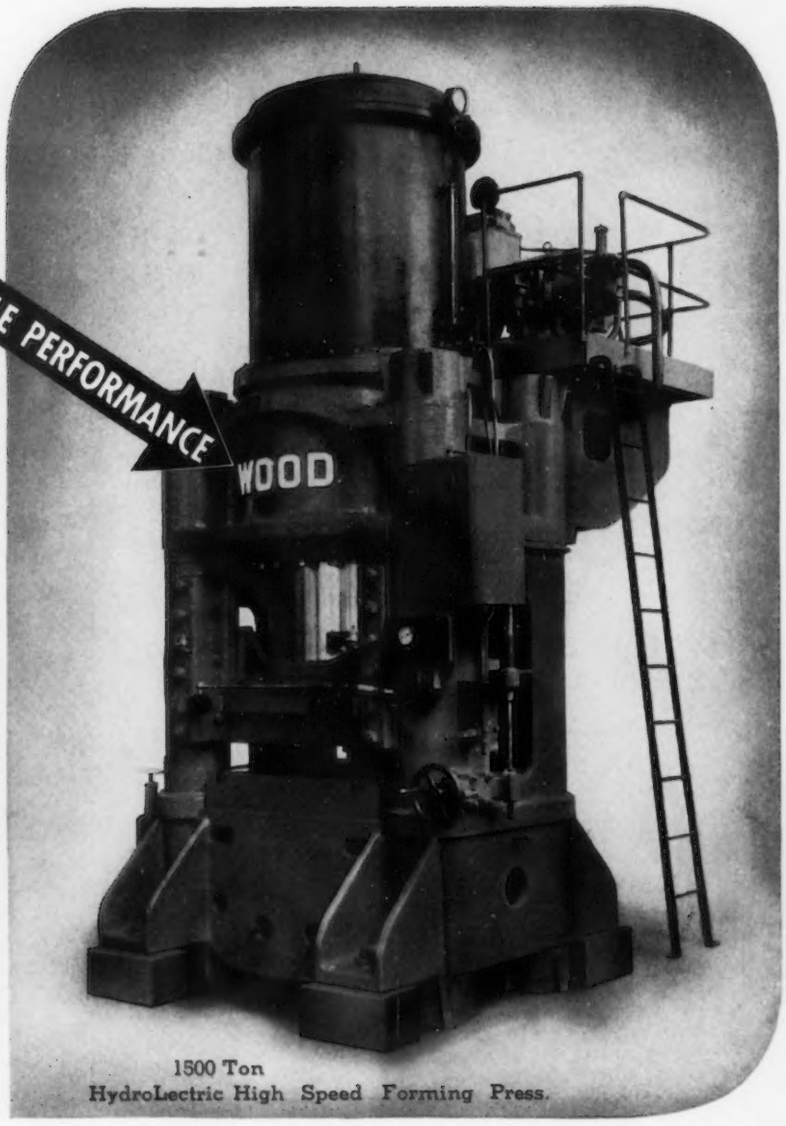
Operating Valves — Hydraulic Pumps — Accumulators — Plate Planers — Bending Rolls — Testing Equipment — Special Hydraulic Machinery

SOUTHWARK *Hydraulic* PRESSES

A MARK of DEPENDABLE PERFORMANCE

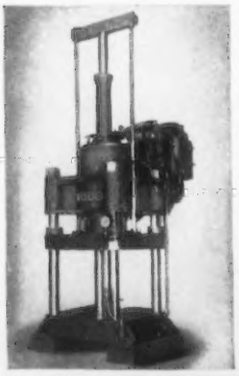


Welded Steel Frame, 350 Ton,
Open Gap, Metal Forming Press.



1500 Ton
HydroLectric High Speed Forming Press.

HYDRAULIC PRESSES . . .



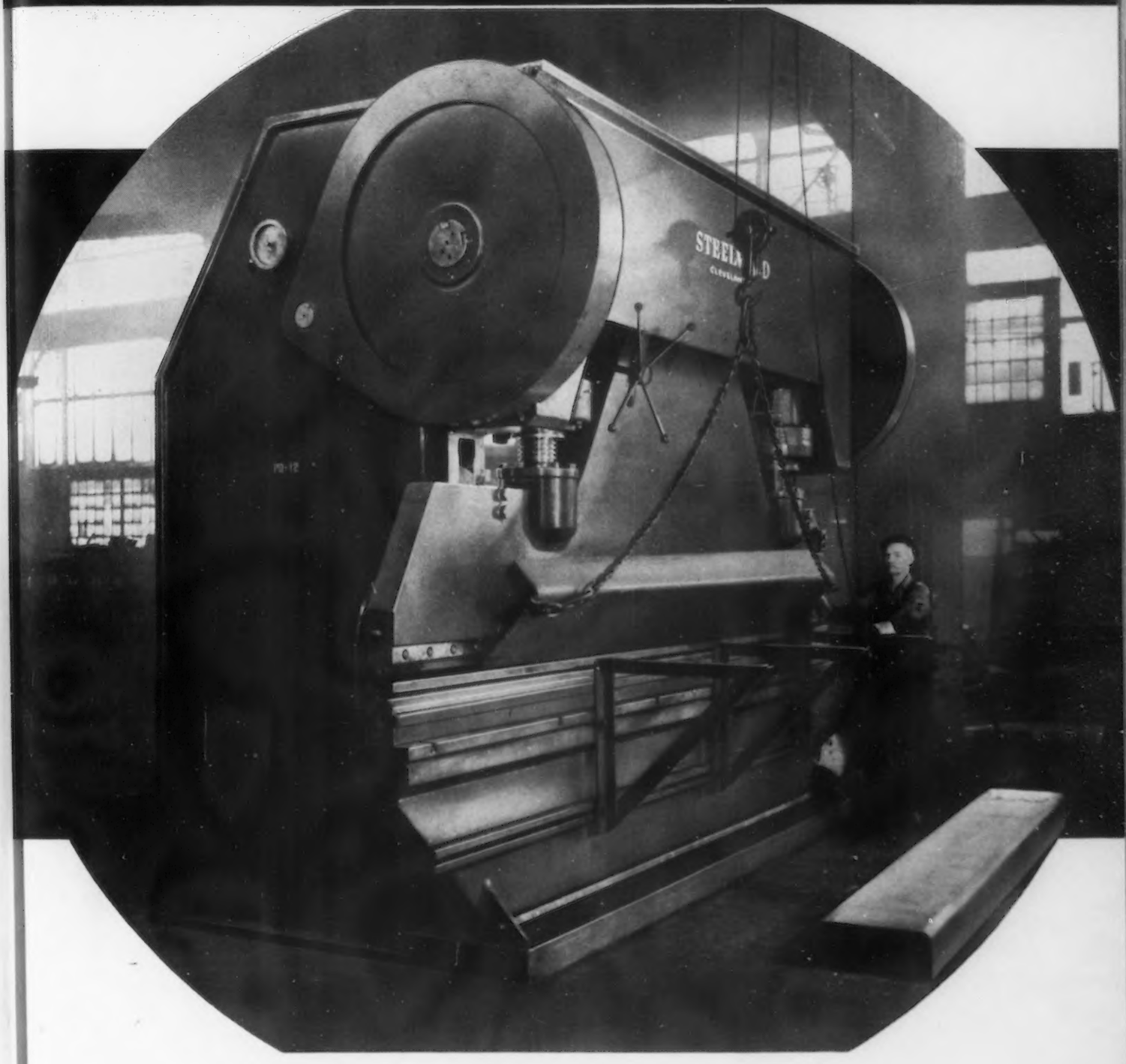
There is good reason that the name WOOD appears frequently on modern hydraulic press equipment. Engineering of the R. D. Wood Company offers either high speed or normal speed operation, welded steel plate or bolted frame construction, built-in pumping and electrical equipment, or other special details to fulfill individual requirements. The presses shown are but a few of the many produced by R. D. Wood Company.

ESTABLISHED 1803

R. D. WOOD CO. PHILADELPHIA PENNSYLVANIA

HYDRAULIC PRESSES *and* VALVES *for* EVERY PURPOSE

STEELWELD *Bending Presses*



The owner of this 750 ton Steelweld Bending Press states the savings estimated by its use, made possible a profitable contract and provided many man hours of employment.

THE CLEVELAND CRANE & ENGINEERING CO.

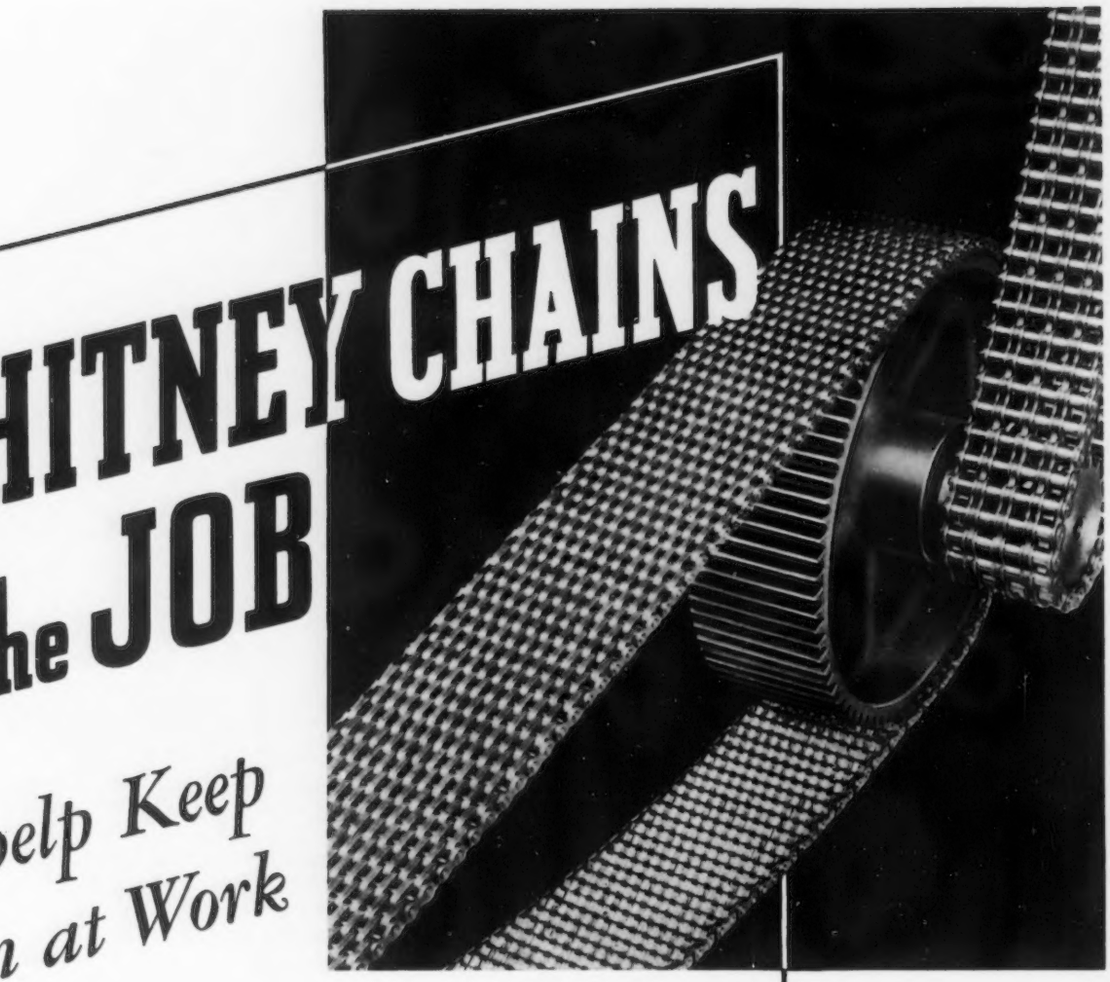
STEELWELD MACHINERY DIVISION

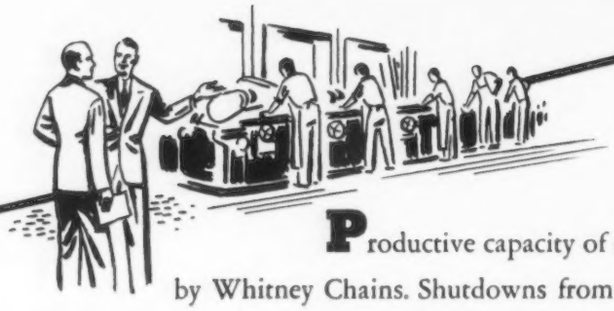
WICKLIFFE, OHIO.

CYRIL BATH & CO., GENERAL SALES AGENTS . . . . E. 70TH & MACHINERY AVE., CLEVELAND, OHIO

WHITNEY CHAINS on the JOB

. . . help Keep Men at Work





Productive capacity of machines is consistently maintained by Whitney Chains. Shutdowns from transmission troubles are avoided . . . servicing and maintenance requirements are minimized. Long chain life is assured.

Whitney dependability is firmly based on advanced engineering . . . finest alloy steels . . . laboratory-controlled heat treatment . . . and precision manufacturing standards maintained by the skill of long-experienced Whitney craftsmen. These hundreds of men, steadily at work making Whitney Chains, *will help to keep men steadily at work in* your *plant.* That's why it pays to specify Whitney for all chain requirements in power drive and conveyor applications. More than 40 years of experience is at your service . . . *use it freely.*

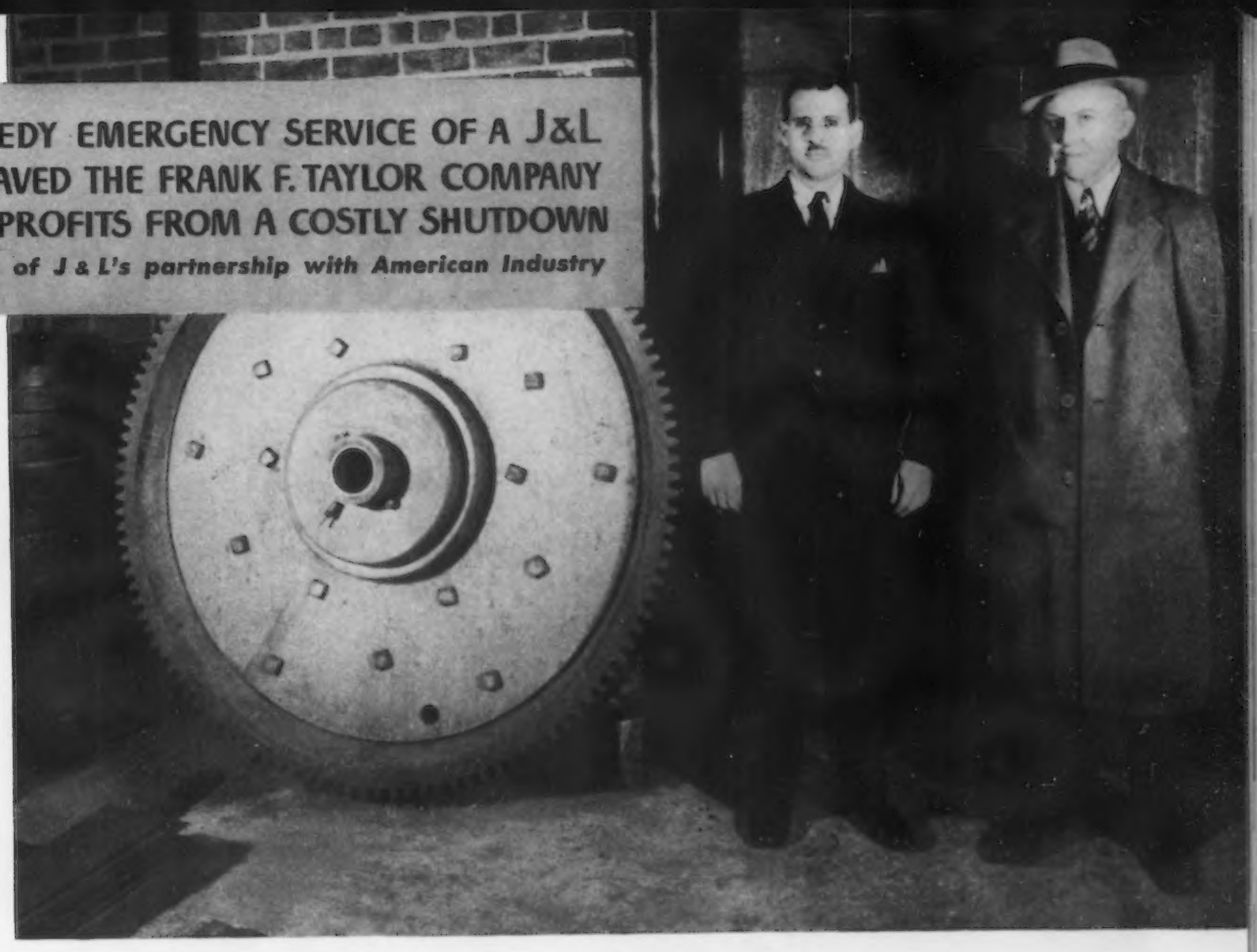
SEND for BULLETIN V-124 on the complete WHITNEY line:

Roller Chains Silent Chains
Conveyor Chains Sprockets
Flexible Couplings

THE WHITNEY CHAIN & MANUFACTURING CO., HARTFORD, CONN.

HOW THE SPEEDY EMERGENCY SERVICE OF A J&L WAREHOUSE SAVED THE FRANK F. TAYLOR COMPANY THE LOSS OF PROFITS FROM A COSTLY SHUTDOWN

Another example of J & L's partnership with American Industry



A plant operating full time — to fill immediate orders — then a fly-wheel cracks, causing what looked like a serious production delay. Mr. W. N. Muchmore of The Frank F. Taylor Company, Cincinnati, Ohio, writes as follows telling how the prompt cooperation of the J & L Cincinnati Warehouse helped him out of this difficult situation:

"During our extremely busy season, we had the misfortune of having a fly-wheel crack on one of our important Punch Presses. In order to keep this press operating until a new fly-wheel could be obtained it was necessary to repair the cracked fly-wheel. This required two pieces of 5/8-inch thick hot rolled steel 61½ inches outside diameter and 22½ inches inside diameter. The fly-wheel cracked at 8 P.M. and we needed the steel by 7:30 the next morning to keep the press running and our plant in production.

"We called our J & L representative, Mr. Guethlein, at his home about 9 P.M. and told him what we needed and when delivery must be made to our plant. Without hesitation, Mr. Guethlein said 'You will have it by 7:30 tomorrow morning.'

"Thanks to Mr. Guethlein and the Jones & Laughlin Warehouse the steel was delivered to our plant before 7:30 the next morning and in a very short time the press was operating again."

You never know when you, too, may be faced with an urgent problem which your J & L Warehouse can help solve — the need of the right kind of steel in a hurry. You can be sure your J & L Warehouse has it among its stock of Controlled Quality Steels. The J & L Warehouse in your vicinity is amply equipped to supply your smallest or largest requirements — quickly, promptly and efficiently. Do as so many progressive manufacturers do — just pick up your telephone and call your J & L Warehouse.

J & L—PILOTS THE COURSE OF CONTROLLED QUALITY IN STEEL

J & L WAREHOUSES

PITTSBURGH	CINCINNATI	DETROIT	NEW ORLEANS	CHICAGO
26th and Jane Sts.	5th and Vine Sts.	3289 Beaufait Ave.	No. Miro and Japonica Sts.	2250 W. 47th St.
Hemlock 1000	Main 2324	Plaza 0470	Franklin 1131	Virginia 1600

NEW YORK: 30-44 Review Ave., Long Island City . . . New York City, IRonsides 6-8700 . . . Jersey City, Bergen 4-2994 . . . Newark, Market 3-2994

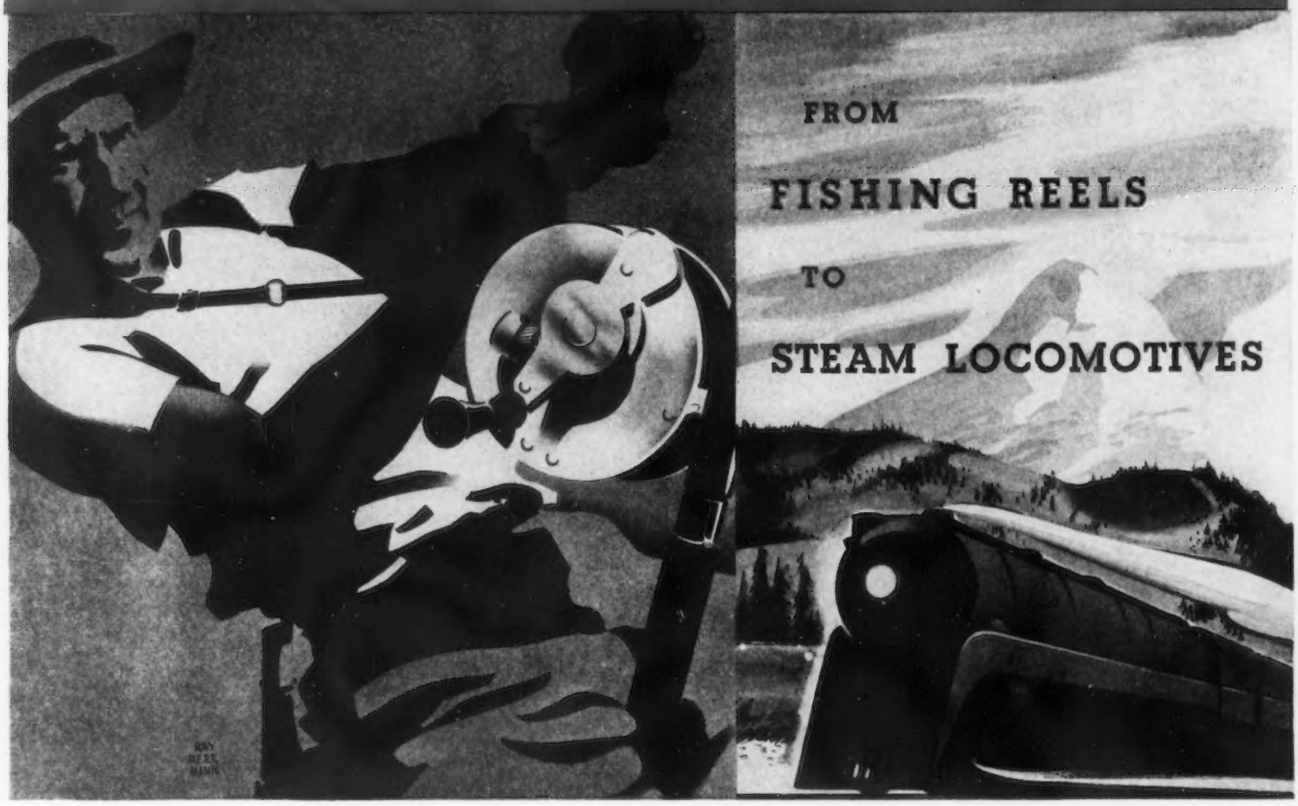
MEMPHIS: 1 Auction Avenue — 5-1625

J&L STEEL

For every need—The right quality of steel in a full range of sizes

J & L — PARTNER IN PROGRESS TO AMERICAN INDUSTRY

STAINLESS STEEL SPRING WIRE



WISSCO Stainless Steel Spring Wire has established an entirely new service standard for springs exposed to moisture, live steam, acids and alkalies. It possesses all the "life" of the best conventional ferrous spring wire, has corrosion resistance equal to all and better than most non-ferrous spring wires, yet takes longer to "set". Many periodic spring replacements that were considered trade nuisances are no longer tolerated. Consider what spring failure means to you. Add the cost of springs and installation to the loss from interrupted service. We will gladly give you the story of savings of Wissco Stainless Steel Spring Wire.

WICKWIRE SPENCER STEEL COMPANY

500 Fifth Ave., New York; Buffalo, Chicago, Detroit, Worcester. Pacific Coast Headquarters: San Francisco. Warehouses: Los Angeles, Seattle. Export Sales Dept.: New York

Wickwire Spencer manufactures High and Low Carbon Wires—in various tempers, grades and finishes—for your specific purpose. Hard-Drawn, soft or annealed Basic or Bessemer Wires—Hard-Drawn annealed, or oil-tempered Spring Wire, Chrome Vanadium Spring Wire—Valve Spring—Music—Clip—Pin—Hairpin—Hook and Eye—Broom—Stapling—Bookbinding—Dent Spacer Wire—Road Wire—Clock—Pinion—Needle-Bar—Screw Stock—Annealing—Binding—Brush—Card—Florist—Mattress—Shaped—Rope—Welding. Flat Wire and Strip Steel, High or Low Carbon—Hard, annealed or tempered—Clock Spring Steel—Corrosion and Heat Resisting Wires. Consult the Wissco technical man on your wire problems, however large or small.

WISSCO WIRE
by Wickwire Spencer

SAFETY in the Air ... SAVINGS on the Ground

WITH AMERICAN PLUS PHILLIPS SCREWS

To Chief Test Pilot Wagner, American PLUS Phillips Screws mean a *safer* assembly.

To Chief Mechanic Smith, they mean faster, *lower-cost* assembly.

Speed and safety rule the aircraft plant just as they rule the air. VULTEE AIRCRAFT used American PLUS Phillips Recessed Head Screws on their new V-12 Attack Bombers because

American PLUS Phillips Screws are *safe* to use. The driver can't leap from the recessed head and tear a gouge across a cockpit enclosure or gash a mechanic's hand. Despite a large increase in production, accidents are greatly reduced.

American PLUS Phillips Screws are *fast* to use. Power driving. No screws fumbled. One hand free for holding work. No screws driven crooked. No heads split.

R. M. PALMER, *Chief Engineer of* **VULTEE AIRCRAFT,** *says,*
"In building high performance aircraft it goes without saying that the use of only the best materials and products is imperative. American PLUS Phillips Screws are used extensively throughout our latest type attack-bomber, Model V-12.

"We are pleased to acknowledge the fact that your product shares a vital part in achieving high performance and dependability in Vultee airplanes."

Chief Mechanic Smith *points out where American PLUS Phillips Screws are used in installing wing fillets on Vultee V-12 Attack-Bomber.*

It Costs Less to Use American PLUS Phillips Screws

For greatest driving ease, the angles of the tapered recess were carefully worked out to utilize the driver's maximum turning power. Two sizes of Phillips Drivers give greatest driving efficiency with screws in diameters from #5 to #16 inclusive. Four drivers cover the entire range of screw sizes.

American PLUS Phillips Screws are cold forged to tolerances of plus or minus .001" — are inspected by a special method of individual handling.

SEND TODAY FOR FACTS ON HOW YOU CAN SAVE Why don't you find out, today, what *your* firm could save? Use the coupon below, for free information or a sample box of driver and screws.

AMERICAN PLUS SCREWS

with the patented PHILLIPS *recessed head*

U. S. Patents on Product and Methods Nos. 2,046,343; 2,046,837; 2,046,839; 2,046,840; 2,082,050; 2,084,078; 2,084,079; 2,090,338. Other domestic and Foreign Patents Allowed and Pending.

Chicago Office and warehouse: 219 W. Randolph St.
Reading Screw Company, Norristown, Pa.
(division of American Screw Co.)

Detroit Office: 1010 Stephenson Bldg.
Pacific Coast Representative: Osgood & Howell, Los Angeles, Seattle, San Francisco

IT COSTS LESS TO USE AMERICAN PLUS PHILLIPS SCREWS

AMERICAN SCREW COMPANY • PROVIDENCE, RHODE ISLAND

AMERICAN SCREW COMPANY,
Providence, Rhode Island

☐ Send special bulletin on ..... industry.

☐ Please send sample kit of American PLUS Screws and driver. $1.00 to cover cost of packaging and postage is enclosed.

Name .....

Company .....

Address .....

Distributor .....

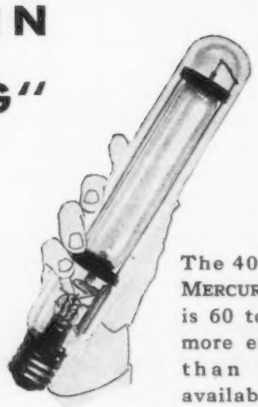
Complete stocks of American PLUS Screws and Drivers are in the hands of distributors everywhere. Ask your distributor.

Slotted Head and Phillips Recessed Head WOOD SCREWS MACHINE SCREWS SHEET METAL SCREWS STOVE BOLTS and a complete line of allied fastening devices

No "EYE-TAX" Permitted!

. . . PLANT BANISHES PROFIT DRAIN WITH "ENGINEERED LIGHTING"

"Eye-Tax" is luxury that no industry can afford. Your Plant's most critical control devices are human eyes. They operate at slow speed in dim areas—and the average industrial lighting is about 5 foot candles. Dim indeed! "Eye-Tax" is inevitable. It steals the energy needed to keep eyes alert and product quality high. » » » Modern lighting, engineered to the job with General Electric Type H Lamps abolishes "Eye-Tax." It provides a truly economical means of obtaining the necessary higher levels of illumination. You get higher light output for the same cost of energy. When blended with incandescent light, these mercury lamps provide illumination which simulates and blends well with daylight. » » » Have a lighting specialist show you how to banish "Eye-Tax" with lighting engineered to fit the job. For complete information, write to the General Electric Vapor Lamp Company at either address given below.



The 400-Watt MERCURY Lamp is 60 to 140% more efficient than other available light sources.

Order your auxiliary devices which were designed especially for this lamp from the General Electric Vapor Lamp Company.

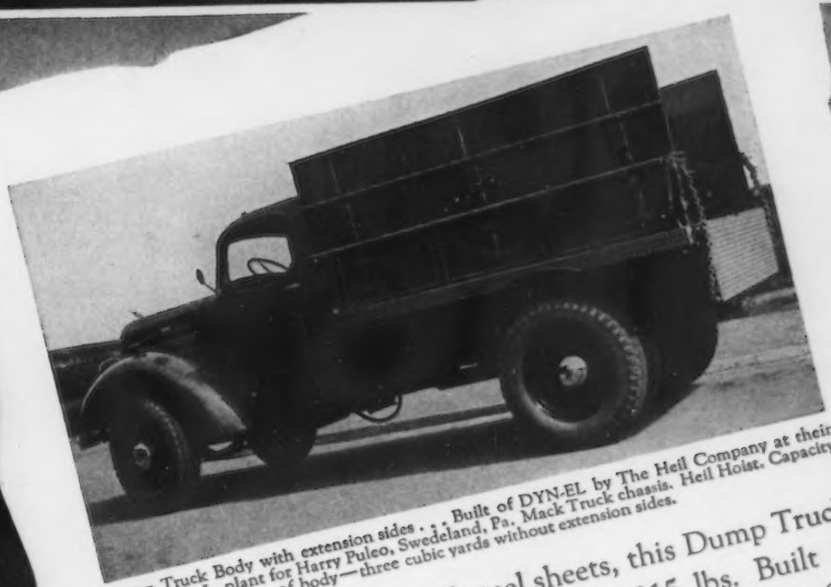
GENERAL ELECTRIC

926H

General Electric Vapor Lamp Co.
833 Adams Street, Hoboken, N. J.

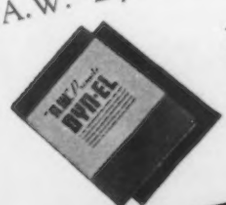
Incandescent Lamp Department
Dept. 165, Nela Park, Cleveland, Ohio

Cut Weight of Dump Truck Body 605 Lbs.



Dump Truck Body with extension sides . . . Built of DYN-EL by The Heil Company at their Hillside, N. J., plant for Harry Puleo, Swedeland, Pa. Mack Truck chassis. Heil Hoist. Capacity of body—three cubic yards without extension sides.

Built of 10-gage hot-rolled steel sheets, this Dump Truck Body with extension sides weighs 2,215 lbs. Built of "A. W." Dyn-el high strength steel, it weighs only 1,610 lbs.—a saving of 605 lbs. in dead weight . . . And with all its lightness the body of "A.W." Dyn-el is stronger than a conventional body, and has greater resistance to shock, fatigue and corrosion. Instead of ordinary smooth plate flooring, the lighter, stronger body uses a floor of "A. W." Dyn-el Floor Plate in the Super-Diamond Pattern.

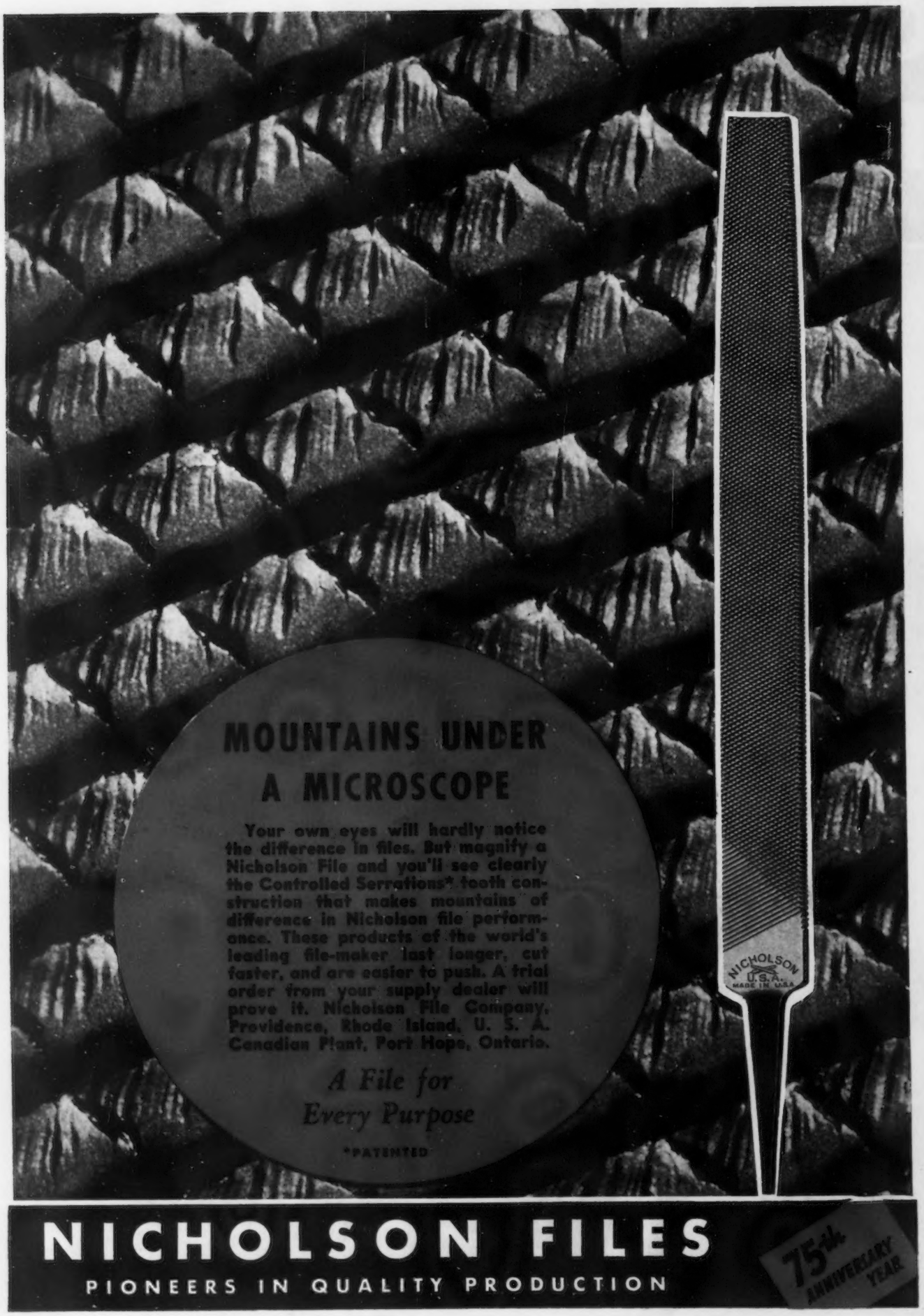


The 48-page book, "A.W." Presents Dyn-el, gives full details of savings in weight and cost possible with this new high-strength, flat-rolled steel. Diagrams, tables and charts cover a wide range of tests and properties. To executives, this book gives a quick picture of performance and costs. To engineers, it gives complete fabricating and design properties and table of sizes and weights. We will be pleased to send you a copy.

DYN-EL

ALAN WOOD STEEL COMPANY

MAIN OFFICE AND MILLS, CONSHOHOCKEN, PENNA. : : SINCE 1826 : : DISTRICT OFFICES AND REPRESENTATIVES—Philadelphia, New York, Boston, Detroit, Chicago, Los Angeles, Seattle, San Francisco, Houston, Roanoke, Buffalo, Pittsburgh, Cleveland, Los Angeles, Cincinnati, New Orleans, St. Paul, St. Louis, Montreal. PRODUCTS INCLUDE—"A. W." Rolled Steel Floor Plate : : "Swede" Pig Iron : : Billets—Blooms and Slabs : : Sheared Steel Plates : : Hot Rolled Sheets and Strip : : Steel Products also furnished in Copper and Alloy analyses.


MOUNTAINS UNDER
A MICROSCOPE
Your own eyes will hardly notice the difference in files. But magnify a Nicholson File and you'll see clearly the Controlled Serrations* tooth construction that makes mountains of difference in Nicholson file performance. These products of the world's leading file-maker last longer, cut faster, and are easier to push. A trial order from your supply dealer will prove it. Nicholson File Company, Providence, Rhode Island, U. S. A. Canadian Plant, Port Hope, Ontario.
A File for
Every Purpose
*PATENTED
NICHOLSON
U.S.A.
MADE IN U.S.A.
NICHOLSON FILES
PIONEERS IN QUALITY PRODUCTION
75th
ANNIVERSARY
YEAR

PARTS SPOILAGE REDUCED FROM 15% TO 1%

• WHEN HE FOUND that parts spoilage had been reduced to 1%, a Detroit manufacturer was pleasantly surprised. When his records also showed a 10% saving in cutting oil costs, and 100% increase in tool life he could hardly believe it.

He had started out to get a better finish on a machining operation on a small diameter taper roller. Close limits in grinding made it impossible to remove any scratches left by machining. 15% of these parts were being scrapped because of poor finish.

There's where the Standard Lubrication Engineer came in. He found that a shaving tool was being used to hold the close limits and smooth finish required. Evidently the cutting oil was not doing its job. He recommended Acme Cutting Oil No. 80.

And there's where the savings started. Parts spoilage dropped from 15% to 1%. Shaving tools that had been reground every 3 hours now ran 6 hours. Fast-draining Acme reduced carry-away and cut oil consumption 10%.

Just the Engineer's suggestion and the right product solved this manufacturer's problem without costing him a cent. Could you use a suggestion like that? You can reach one of these Engineers through your local Standard Oil (Indiana) office.

FIRST IN SERVICE
FOR FIFTY YEARS
STANDARD OIL (IND.)

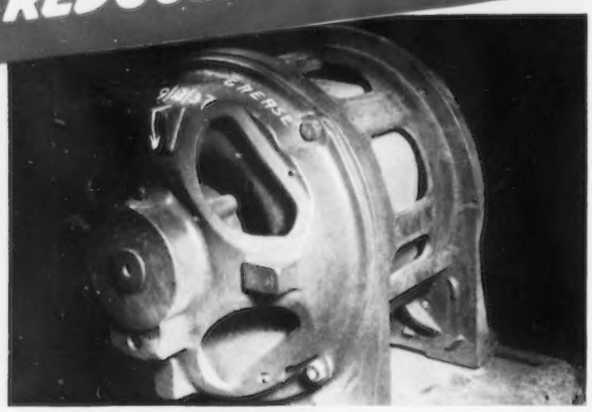
STANDARD OIL COMPANY
(INDIANA)

LUBRICATION ENGINEERING • • LUBRICATION ENGINEERING • • LUBRICATION ENGINEERING • • LUBRIC

...LUBRICATION ENGINEERING...LUBRICATION ENGINEERING...LUBRICATION ENGINE

THESE EXAMPLES PROVE THAT...

THE RIGHT LUBRICANT PROPERLY APPLIED REDUCES COSTS



SUPERLA GREASE

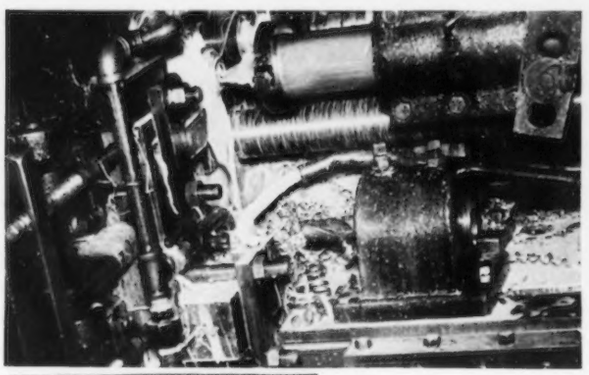
They haven't repacked a Superla-greased motor bearing in nearly two years in a central state lead refinery. And that's unusual because these same bearings had to be repacked every two or three months before a Standard Lubrication Engineer made a survey and suggested a test of Superla X Grease.

In this test, motors were chosen ranging from ¼ HP to 25 HP in both vertical and horizontal types. Superla X was packed in one end-bearing on each motor, and the well-known grease formerly used, in the other end. Superla proved its lasting quality; the other grease didn't. As a result of this test Superla grease will be used exclusively on all grease-packed bearings throughout this plant.

PREMIER CUTTING OIL

An unexpected saving bobbed up when Premier Cutting Oil went on the job, recently, in a certain Michigan tool manufacturing plant. Unexpected, because Premier had been recommended merely to improve the finish on one of the milling operations. A Standard Lubrication Engineer had spotted the possibility while making a cutting oil survey in this plant. He figured that the grinding time on this part could be reduced considerably.

He was right. Premier Cutting Oil No. 150 gave the desired finish . . . but the saving did not stop there. *It included, also, a 20% increase in tool life,* to the pleased surprise of the customer.



SUPERLA SOLUBLE OIL

A Detroit manufacturer had searched for some time for a soluble oil which he could use on Multiple Spindle Automatics. Other equipment in the department used soluble oil but those he had tried gummed the automatic machines, causing lost time and loss of production.

A Standard Lubrication Engineer tested Superla Soluble Oil and recommended the right mixture. The manufacturer has now used Superla successfully for the past four years on all machines. In addition to the advantage of having one oil in this department he has made a substantial saving in oil costs.

MAIL THE COUPON FOR LUBRICATION INFORMATION

STANDARD OIL COMPANY (Indiana), JUNE
910 S. Michigan Avenue, Chicago, Illinois. Room 1223

Gentlemen: Please send me the Monographs checked below.

☐ Lubrication in Grinding ☐ Lubrication in Honing and Lapping

☐ Lubrication in Gear Cutting.

Name _____ *Position* _____

Company _____

Street Address _____

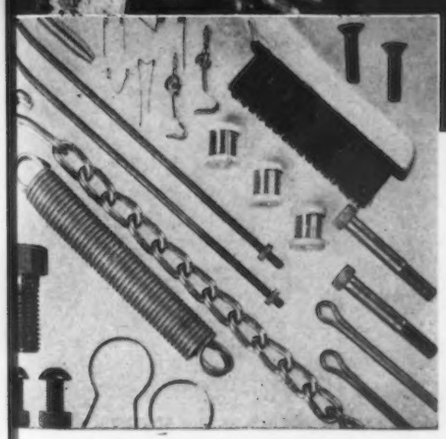
City _____ *State* _____

● TO HELP YOU get better finish, longer tool life or greater production on metal cutting operations the monographs listed in the coupon are available to plant operating men in the 13 states shown on the map. These monographs describe the general requirements of cutting lubricants for various types of work. For more complete information there are experienced Lubrication Engineers located throughout these same 13 states ready to help you find ways to improve your metal cutting jobs. Get to know the Engineer in your territory. Ask for him at your local Standard Oil (Indiana) office or write 910 South Michigan Ave., Chicago, Illinois.

ACCURACY

. . . OR ELSE!

It takes more than Good Intentions to do a Job Right



AND it takes more than good intentions to put quality into wire. We have been making wire for over 100 years. In that time we have built up a background of experience which has been of great value to our customers. For in that time we have fully developed all of the requirements for putting high quality into wire. You can count upon American Quality Wire to give the best results with the greatest economy.

American Quality Wire is carefully checked at every stage of its manufacture to assure that it is accurate in both metallurgical and physical properties. This product is produced in a complete range of sizes, grades, shapes and analyses. Our Sales Department and Engineering Staff will be glad to assist you in determining which wire will best serve your own particular requirements and our plants are strategically located so that deliveries can be made to meet your production schedule.

Premier Spring Wire · Weaving Wire · Pin Wire · Bolt, Rivet and Screw Wire · Broom and Brush Wire · Pinion Wire · Basic and Bessemer Screw Stock · Premier Tested Welding Wire · Flat Nut Stock · Hair Pin Wire · Mattress Wire · Music Spring Wire · Piano Wire · Amercut Cold Finished Steel Bars · Pump Rod Bars · Wool Wire · Wire Rods · Also U·S·S Stainless and Heat-Resisting Wires.

AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* • United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

BETHLEHEM BOLTS

as near as your telephone

WHETHER you need a carton, a keg, a case or a carload of bolts, nuts or other threaded products, you'll find it's easy to get what you want by 'phoning your Bethlehem distributor. He carries a good stock and can readily supply your immediate needs. For special cases, his rush order to our Lebanon, Pa., plant will start your goods on their way from the plant within three hours.

You can depend on Bethlehem bolts. They are consistently high in quality. Threads are clean-cut and smooth-fitting; heads and nuts fit wrenches snugly. And every Bethlehem bolt is backed by a name that stands for quality in steel, by a company having 50 years' experience in making fine steels.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

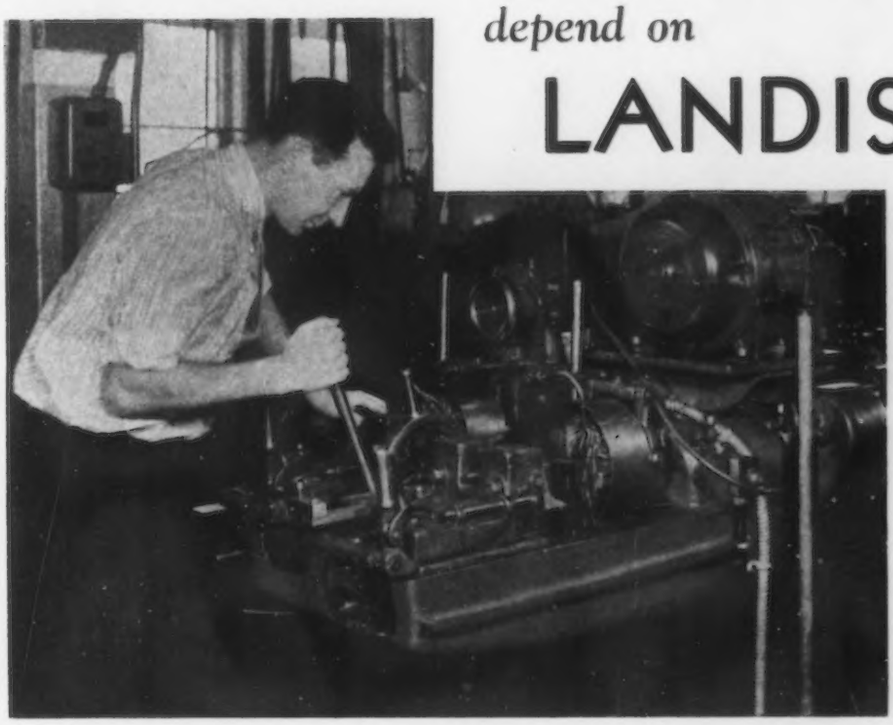
FOR THE ULTIMATE IN MODERNIZATION

LANDISize your THREADS

Manufacturers of Process Control Instruments

depend on

LANDIS



Manufacturers of modern process controlling instruments have for many years used LANDIS Thread Cutting Equipment to cut threads on many of the small parts which are used in Temperature Controllers and other recording devices.

The first LANDIS equipment, a LANDMATIC Head, was purchased by one manufacturer of process controlling instruments in 1926. The fine performance of this head is reflected by the fourteen additional die heads and threading machines which this company have installed over a period of the past twelve years.

To be *Modern* LANDISize your Threads

Write for additional information

LANDIS MACHINE CO., Inc.
Waynesboro, Penna.

THE IRON AGE

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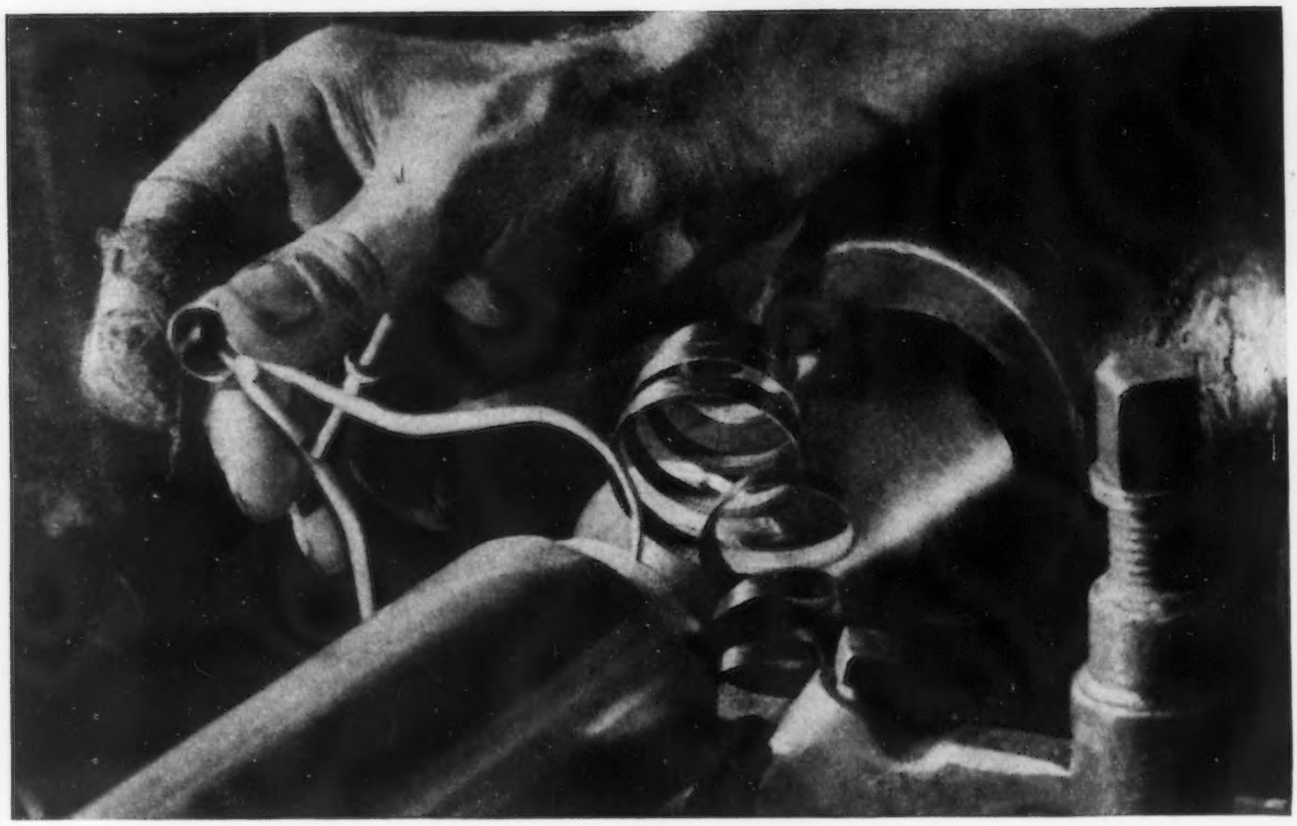
JUNE 8, 1939



Certified Steels Help Lower Labor Costs

Labor costs, rapidly becoming today's No. 1 consideration, are in a measure dependent on materials. On most jobs where steel is used, shop costs are the largest and most variable single factor. While the cost of steel itself is relatively small, the quality plays a very important part in the control of these shop labor costs. If it is hard to fabricate—does not work uniformly—has hard spots to dull or break tools—or in the case of alloys, does not respond properly to heat treatment—then shop labor hours pile up and the job ticket shows red.

To meet this growing need for more uniform, better fabricating steels, Ryerson developed and built up stocks of CERTIFIED STEELS—steels that represent the highest quality in each class and type of material. Users are reporting savings in time, reduction in spoilage and lower labor costs.

Perhaps Ryerson Certified Steels can help you reduce costs. Why not try them on your next job?

RYERSON *Certified* **STEELS**

Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

RYERSON CERTIFIED STEELS

Principal products in stock for Immediate Shipment include—Bars, Structurals, Plates, Iron and Steel Sheets, Tubing, Shafting, Strip Steel, Alloy Steels, Tool Steels, Stainless, Babbitt, Welding Rod, etc.

▲▲▲ THE IRON AGE ▲▲▲

JUNE 8, 1939

ESTABLISHED 1855 Vol. 143, No. 23

National Income Is Machine Made

ON page 11 of this issue is the second chapter in our graphic series presenting the machine as a creator of employment and wages. In this chapter we show time-saving machines in their role of national income accelerators.

You may remember that in the first installment of this series, published in the May 18 issue of THE IRON AGE, we quoted Congressman Charles I. Faddis of Pennsylvania, as representing a legislator's distinction between good and bad machines. The automobile, the radio and other machines of that type are considered labor creating by Mr. Faddis and therefore good. So, too, are machines which relieve workers from hard and dangerous toil. But "time saving" machines, according to the Congressman, "result in unemployment, poverty, distress and labor disturbance."

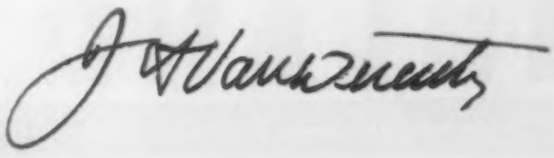
In the presentation that begins on page 11, we show conclusively that the only possibility that we have of increasing wealth or prosperity for all is through the constant application of time saving machinery.

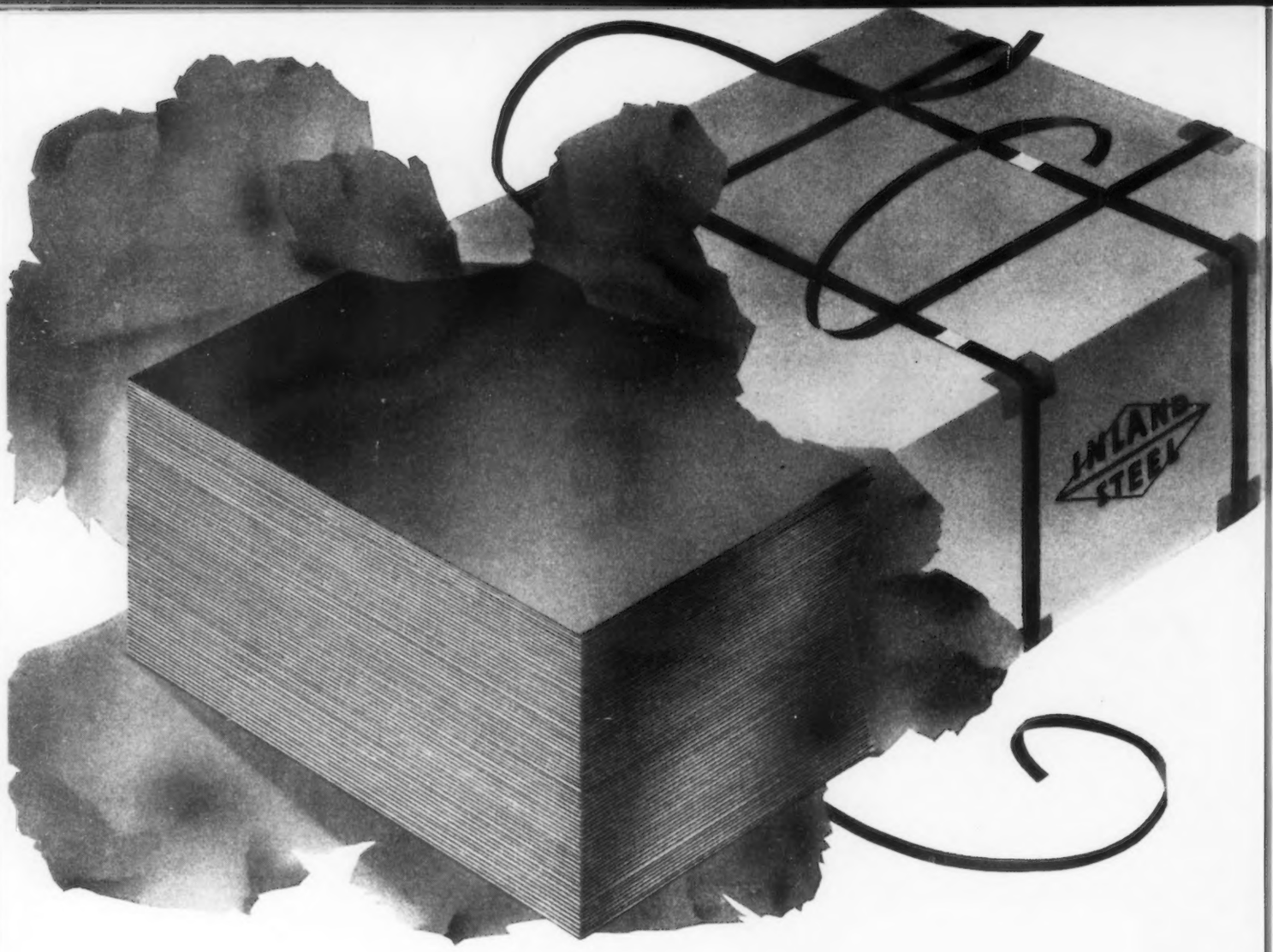
Suppose we had outlawed time saving machinery in connection with the automobile when it was first invented. We would not have had any automobiles today, under those circumstances, for two reasons. First, because the automobile itself is a tremendous time saver. And, secondly, because if we had prohibited the use of time saving machines in making automobiles, a Ford car today, according to W. J. Cameron, would cost the purchaser about $18,000.

So you see you cannot say—"this machine is good" or "that machine is bad." And particularly, you cannot condemn, limit or prohibit the use of time saving machinery without thereby sentencing humanity to the loss of all hope of a better living.

It would seem that the acceptance of just two thoughts should compel every reasoning person to exonerate the machine — time-saving or otherwise — from blame for our troubles and start him looking for the culprits elsewhere. One thought, and we think it is axiomatic, is that national income must continue to be primarily machine made. The other thought is the fact proved by Government record that labor's share in the national income has increased year after year. Put these two thoughts together and you have something real to take hold of.

And, if you want a striking example of the fruits of this philosophy, study the folded chronological chart of "Machines and Progress" which accompanies this issue as a supplement.





Even Steel Should be "Kept Fresh"

It is one thing to make good sheet steel—another to see that it reaches the customer absolutely "fresh"—clean, unmarred, ready for use. Inland does both.

Inland's packing and loading methods are the result of specialized study and long experience. Careful wrapping in moisture-proof paper, and steel wrapping under tension provide the maximum resistance to corrosion and scratching caused by internal movement.

Car loading gets special attention, too. Each package is a floating unit which does not contact others, nor the ends and sides of the car.

The best feature of this method is—it works. It is typical of the service Inland gives every customer—a service which applies to each shipment of steel, large or small.

Inland methods of sheet protection are typical of the care used not only in making, but shipping every Inland Product.

When you need a thoroughly careful steel service of this kind—call the nearest Inland office.

INLAND STEEL CO.

38 South Dearborn Street, CHICAGO • District Offices: DETROIT • KANSAS CITY • MILWAUKEE • ST. LOUIS • ST. PAUL

SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

Craftsmanship IN BALL BEARINGS

By P. W. SCHUBERT

New Departure Division, General Motors Corp., Bristol, Conn.

ALL too frequently the statement is heard that fine craftsmanship is a thing of the past, what with the advent of modern, infinitely accurate, high production machinery. Such a statement, when regarded in an analytic light, develops to be the result of inability to grasp the true picture of what has really happened. The actual state of affairs embraces the fact that yesterday's standards of ultra-perfection have become today's commercial requirements. The craftsman of yesterday is not only still with us, but indeed becomes more urgently necessary in a world of commerce shot through with the ever-tightening threads of competition.

Delicate instruments, making up part of the marvels of modern airplanes, submarines, radios, and innumerable other mechanical contrivances, demand the utmost in scientific and mechanical perfection. And, indeed, it should not be forgotten for a moment that the very accuracy of high production machinery itself requires the utmost in infinite patience and painstaking care—this in reality is the essence of true craftsmanship.

Although it probably has not occurred to the casual user, ball bearings are perhaps one of the most definite illustrations of the degree to which yesterday's comparatively rare craftsmanship has been converted to today's commercial standards.

A simple thing to look at, the common automobile front wheel bearing—produced by the thousands—is yet an article whose common standards of preciseness in fabrication would have been, in the past, a model of extreme perfection, considered attainable only by the most rigid adherence to disciplined workmanship, and at a price which would make it prohibitive as an accessory in the average automobile.

With this constant elevation in standards of perfection in ball bearing manufacture, it might reasonably be expected that commercial standards and ultra-precision workmanship would become one and the same thing. To the contrary, however, the experience so gained leads the true craftsman on and on to new heights of superlative quality.

Thus it is that a bearing with an even greater degree of accuracy and perfection of finish is available for installations where performance has the ascendancy over price. In Fig. 1 are shown sections of ball raceways: That on the left is a raceway from a commercially perfect bearing, which, as far as ball race is concerned, will deliver a maximum of quiet, long-life service; the photomicrograph on the right shows an area of a ball race from an ultra-precision bearing, in which detrimental characteristics (minute in the commercially perfect bearing) have here been reduced to the vanishing point.

Fig. 2 shows a sample of one of

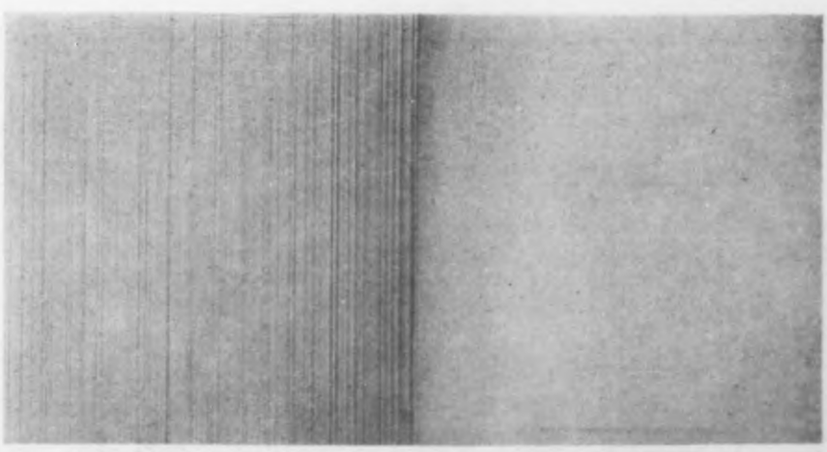


FIG. 1—Section of a commercially perfect ball raceway (left) as compared with an ultra-precision raceway (right). Both views at 100 diameters.

ABOVE

FIG. 2—An example of a commercially available product which in precision and quality is like a gem.

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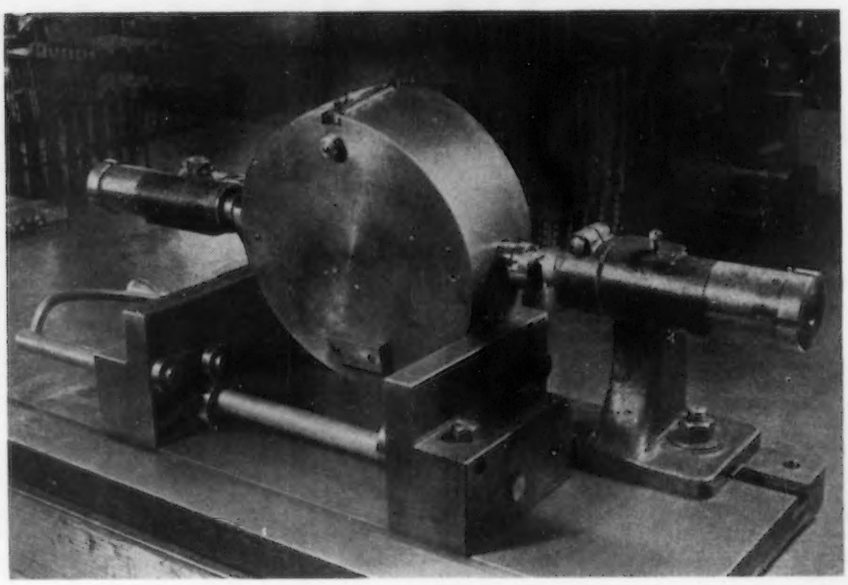
AT RIGHT

FIG. 3—Swing test for determining the drag in a bearing.



these superlative quality products, fashioned with all the care and adherence to fine workmanship that characterized the product of the skilled, old-time masters.

It must be emphasized that these bearings stand in a class by themselves. In addition to extreme care in manufacture, inspection and testing is carried to microscopic limits. Many of these bearings may become the deciding factor between life and death, in the installation for which they are intended. In other instances, the ability to procure them makes possible the existence of this or that mechanism.

The ingenuity displayed in the design and functioning of testing fixtures for masterpieces of the bearing art—like those, for instance, that are used in gyroscopes—is well worth discussion.

Testing For Drag

Friction and gravity, the enemies of the gyroscope, must be definitely overcome. Positive positioning of its whirling parts entails a bearing possessing maximum freedom from friction or drag—no guesswork is allowed.

In Fig. 3 is shown the "swing test." This device consists of a solid, cylindrical block of metal about a foot in diameter. At diametrically opposed points in its circumference are two pivots, upon which bearings to be tested may be mounted. The pivots engage the bearing bore. The product in place, the outer ring of the bearing is then rested in accurately finished saddles. Thus the metal block is supported by the bearings, and, when tilted to a definite angle and released, will swing or rock back and forth in ever decreasing arcs. Twenty-five swings denote an acceptable bearing with certain types. Frequently bearings allow as many as 40 oscillations. A dirty bearing, or a bearing with too tight a setup will restrict the free movement of the metal block causing it to come to rest prematurely. A spirit level mounted on top, and a set screw in the face allow flexibility of adjustment.

Another novel testing machine is pictured in Fig. 4. In this case, the bearing is mounted on a shaft. The shaft operates at a few degrees off perpendicular. At the left of the shaft, in Fig. 4 (left) is shown a cap which is designed to rest upon the outer ring of the bearing, as in Fig. 4 (right). Through a reducer, the shaft, engaging the bearing bore, is rotated slowly, causing the inner ring to revolve. The super-imposed cap has an arm affixed to its base in such a manner that it will, by gravity, cause the cap to find its normal position. As the inner ring is rotated, any dirt or other imperfections between inner ring, balls and outer ring will impart the movement to the outer ring, causing it to swing back and forth—the length of the arc, measured in graduations on the scale, determines the acceptability of the bearing.

An idea somewhat similar is shown in Fig. 5. Here the bearing is also mounted upon a slowly rotating, vertical shaft. The cap, which rests upon the outer ring, is fitted with two long arms. Upon an adjacent circular table, a tiny brass weight is placed at a marked point. Fig. 5 (right) shows the cap in place with one of its arms resting against the weight in such a manner that should the cap rotate with the bearing outer ring, it would force the weight off the table top. An acceptable bearing fails to displace the tiny weight. For different bearings an assortment of weights is available, some weighing 2½ gm. or less.

In this apparatus, it is essential that consideration be given to the variation in the different coefficients of friction of the brass weight and the material of which the table is made.

Runout and Torque Tests

In Fig. 6 is shown a method of testing double row bearings for runout. The bearing is mounted in such a way that two contact points rest on the outside diameter, one over each ball race.

The gage actuating mechanism operates at a distance of 2 in. from the face of the bearing, allowing corresponding magnification of the runout error. The bearing is revolved and the amount of runout measured on the 0.001-in. indicator—"runout" referring to lack of parallelism between the ball races. Such a condition results in "weaving" of the outer ring, the amount or lack of such weave being the object of the test.

Fig. 7 shows a simple but ingenious little gadget used in torque testing. Here the bearing is held in a rotatable fixture which has two long arms projecting from its circumference. Each arm is fitted with sliding weights. Looking at the picture, the arm to the right is marked at inner and outer extremities with red areas. The sliding weight (shown in the center of the arm) is moved in toward the bearing to a point a specified distance from the bearing bore. With the weight in this position, the bearing is too loosely assembled if it allows the weight to pull the arm down.

Next the weight is moved toward the outer end of the arm. When in this position, with the arm horizontal, the bearing is too tight if the weight fails to drop.

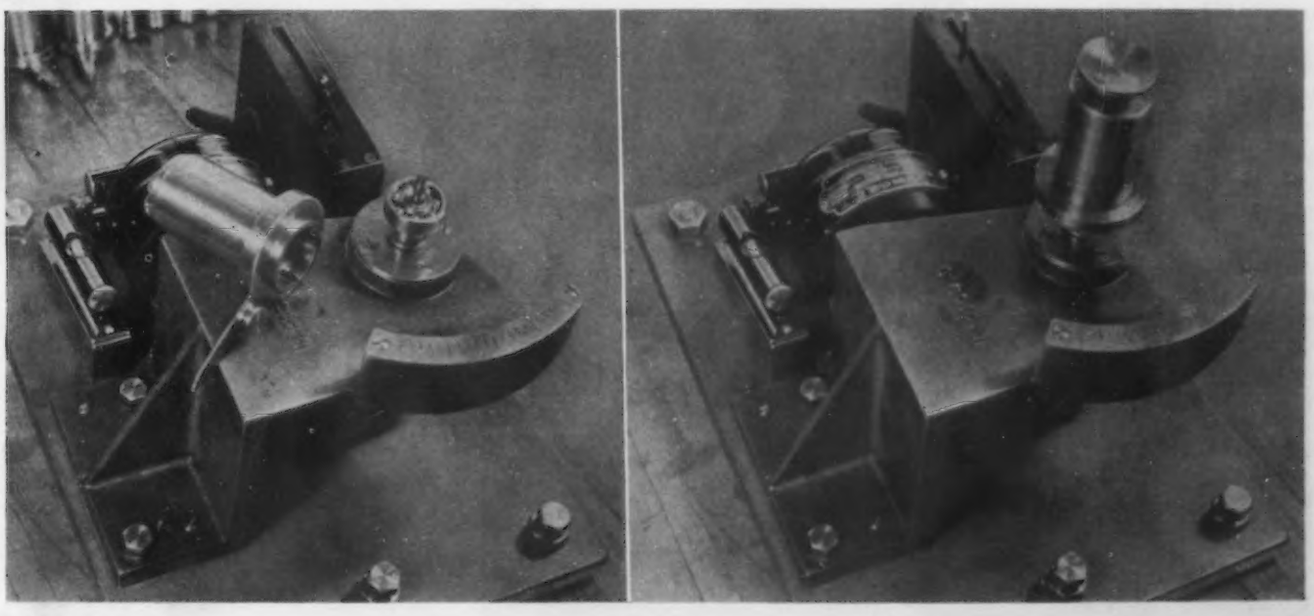
The bearing shown in this test is worthy of remark. It consists of two rings with three balls. It is used as a speed reducing unit—by utilizing the variation in angular velocities of two of the members as in the case of any planetary device. Out-of-roundness in this bearing becomes a highly important defect. Raceways having alternate high and low spots would provide tight and loose spots under torque, and this would result in a holding and release effect in the bearing undergoing test.

In addition to the control exercised over the production of these bearings, the balls used in them offer striking examples of close adherence to strict standards. In the case of ultra-perfect bearings, a complement of steel balls must match in roundness or size with a tolerance of 0.00001 in. Ball complements for commercial bearings are accurate to the extent of 0.0001 in.

The steel ball could be thought of as being more or less in the same position as the wheel as far as general recognition of its value as a mechanical device. Wheels are such a common, everyday item that their true relationship has been lost sight of. Similarly, steel balls appear so simple that they are more or less taken for granted, it being difficult for the average person to visualize the painstaking care with which they are made. The control of grain structure, close adherence to requirements for sphericity, extreme care in matching sizes, the control of surface finish to insure freedom from wear-producing defects —all these factors go to make the job of ball fabrication a procedure requiring utmost skill.

Actually, the mirror-like finish of steel balls is not alone the product of an effort to reduce friction losses. These exquisite surfaces are direct and visible results of the extreme accuracy which has grown to be a commonplace characteristic of the product.

Stresses occurring in the contact



ABOVE

FIG. 4—Another machine used to test for drag and imperfections.

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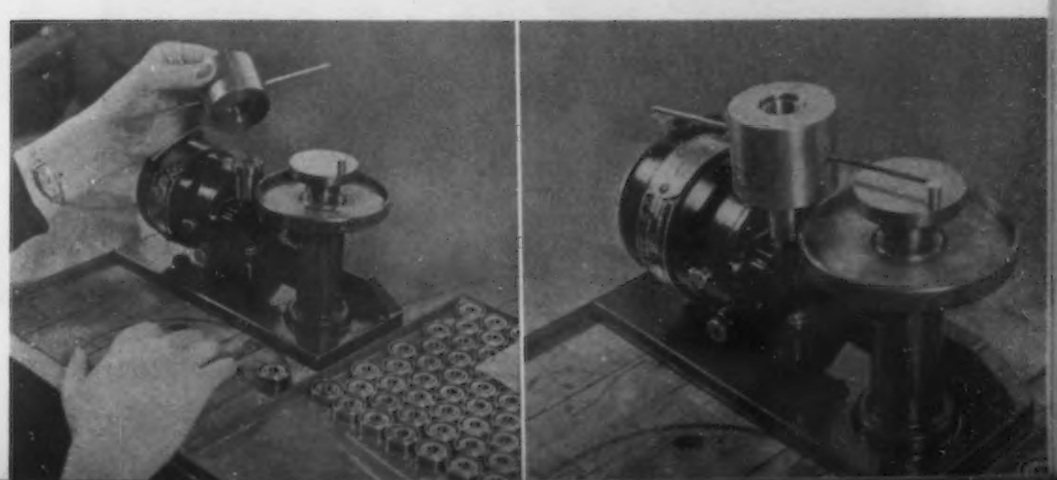
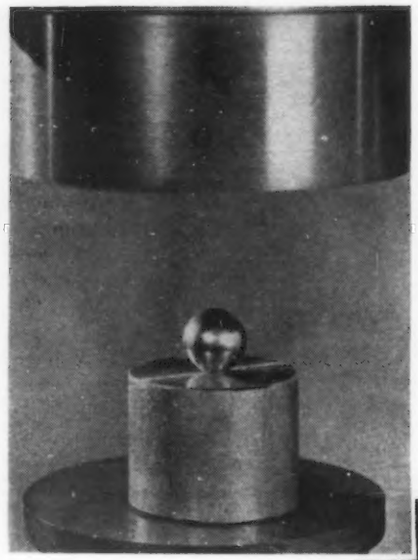
AT RIGHT

FIG. 5—This type of equipment is frequently used for testing bearing drag.





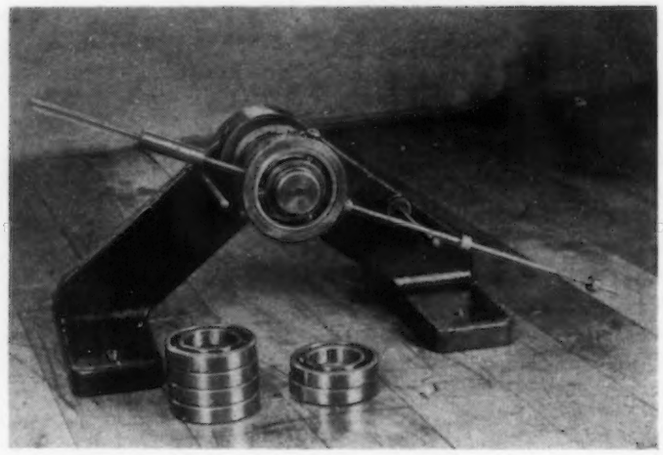


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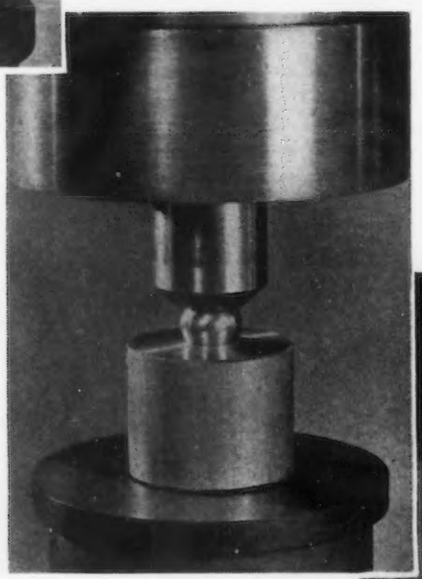
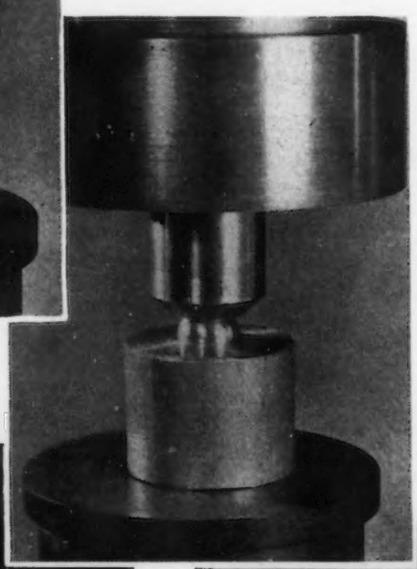
FIG. 7—Bearing torque is tested for by means of this ingenious little gadget.



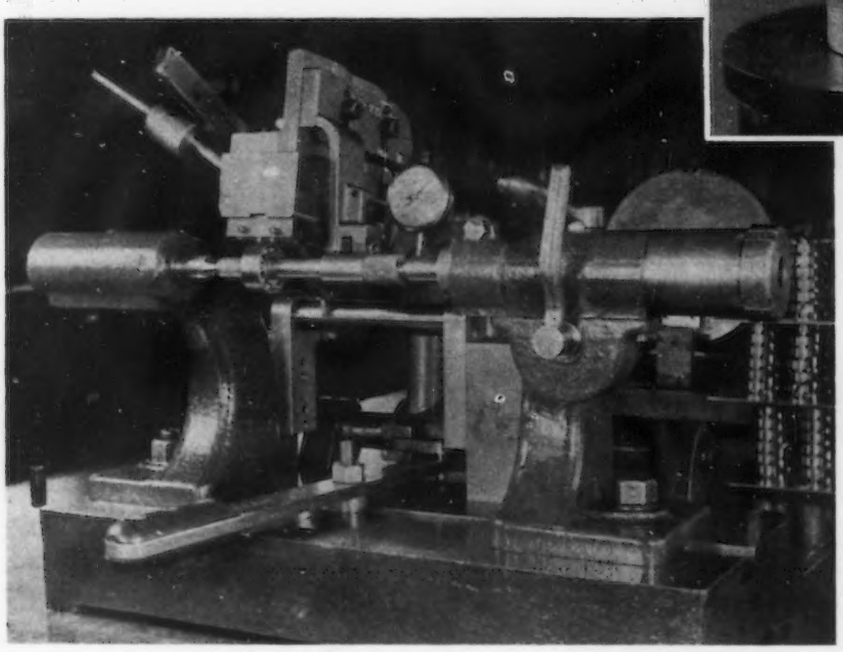
BELOW

FIG. 6—This machine is used to determine "run-out" in a bearing.



AT LEFT

FIG. 8—A hydraulic press forces a bearing ball into the steel block to test it for ability to stand up under severe load conditions.



areas of balls and races vary from 200,000 to 300,000 lb. per sq. in. under normal load conditions. To test the ability of balls to sustain such pressure, a method shown in the four illustrations of Fig. 8 is used.

In this test, a standard steel ball is placed on a test block, the latter mounted in a hydraulic press. Slowly, the pressure is applied and increased until it reaches 90 tons. The ball is pressed into the block until it has reached its diameter. After it has been thoroughly imbedded, the ram is drawn away and the ball removed from the depression. The block is cracked and distorted—but the ball is round and is good for more testing.

Thus, it may easily be seen that, though primarily a bearing plant must be capable of producing ball bearings of a given type in quantity and to extremely high quality requirements, it is of greater importance that such a plant be equipped with men whose ability and craftsmanship enables them to produce commercial merchandise of superlative quality, capable of withstanding extremely rigorous punishment in service.

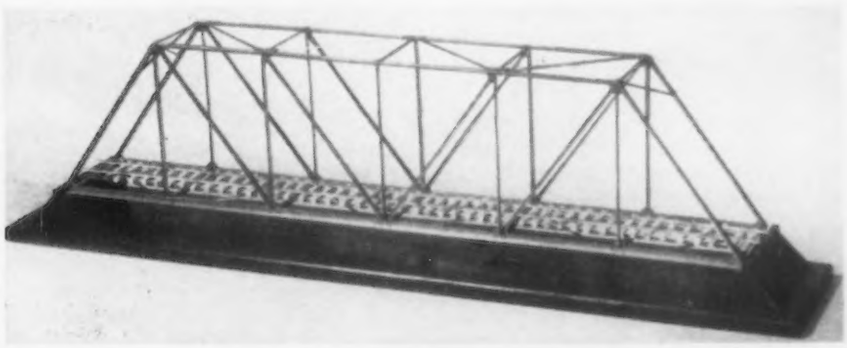
Furthermore, in addition to its regular line of high production bearings, such a plant must be able to produce the ultra-precision made-to-specification bearing, each unit representing the utmost in fine workmanship and trouble-free operation. In all instances, results are the paramount consideration.

Minute Shapes in Metals and Plastics An Aid to Model Makers

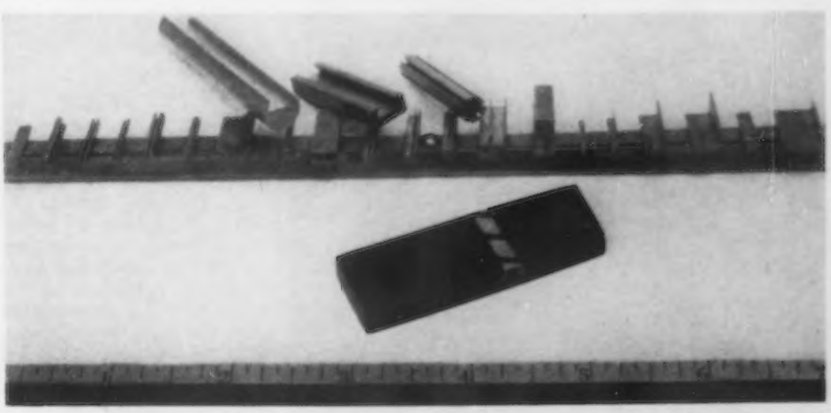
TINY shapes in every conceivable design and thinness are now being made in metals and plastics for instrument and model makers, scientific workers and architects. Because of their accuracy, these shapes are also adapted to the construction of true scale models, such as the single-track railroad bridge illustrated. The new process by which these shapes are made was developed by Precision Shapes, Inc., 230 Park Avenue, New York, but because of patent delays details are not available at this time. Formed chiefly of brass, but also available in other non-ferrous metals and plastics these minute structural sections are neither extruded, rolled nor milled, but are rather formed and shaped. The process eliminates expensive die costs for short runs, yet is flexible enough to provide undercut forms.

Standard designs of these Precision Shapes kept in stock begin with angles 1/32 in. on a side and only 0.010 in. thick. T's start at 1/16 in. by 0.012 in. wall thickness, and I-beams of the same dimensions. Other standard shapes include channels, Z's, columns, square channels, H-sections and various slotted shapes, such as box-dividing centers. Any conceivable shape, undercut or decorative type of strip can be made to specification. Tolerance on size is generally held to 0.002 in. and has been extended to 0.0005 in. in special cases.

In plastics, Precision Shapes have many uses depending on the nature of the plastic material. Internally, many different shapes are used to hold glass and metal, while also acting as a reinforcement for the plastics. Externally, special decorative shapes add beauty in addition to stiffening the structure and preventing warping.



MANY a board director cannot read a blueprint but can readily appraise a structural project from a true scale model. This 3-ft. model of a through Pratt truss bridge of 143 ft. span was made of Precision Shapes to a scale of 1/4 in. to the ft., even to the web thickness of the channels and angles



SOME of the many shapes and sizes in which Precision Shapes are available from stock. Simulating man-size structural shapes, several types begin at 1/16 in. or less, with wall thickness of 0.012 in.

MACHINE TOOLS OF THE MONTH

° ° °

By FRANK J. OLIVER
Associate Editor, The Iron Age

° ° °

AMONG the machine tools announced by the makers during May are the first of general purpose Superfinishing machines and unit heads. New developments have also taken place in broaching equipment, gear finishing machines, portable electric grinders of both the electrical and air driven types, lathes, millers of the hand and huge planer type, turning and tapping machines. A number of machine tool accessories are also described. A grinder manufacturer is using a new type of multi-speed motor drive for the headstock.

ANNOUNCEMENT has been made by the *Foster Machine Co.*, Elkhart, Ind., of the availability of a general purpose Superfinishing machine for performing the operation on cylindrical surfaces up to 4 in. diameter and 18 in. long, or 6 in. diameter on shorter work. A unit head for mounting on the compound of an engine lathe cross slide has also been introduced. These general purpose machines have already been installed in several aircraft plants, automobile companies, a tool and die shop, and others.

Made under license of the Chrysler Corp., the machines embody the same technique as described under Chrysler's Superfinishing technique in THE IRON AGE, Sept. 1, 8 and 22, 1938. Essentially, the process involves a multi-motion action of a hard, stick type abrasive under light pressure and controlled lubrication. Recently published tests (THE IRON AGE, May 18) show that the amorphous, ductile metal left on the surface as a result of previous machining operations is completely removed, exposing the sheared crystalline structure of the metal, said to have extremely long wear life.

The original machines built for the Chrysler Corp. were of a single purpose type. The general purpose machine enables the average plant to obtain surface finishes on cylindrical parts reading as low as 2 micro-in. roughness on the Profilometer. The headstock of the machine may be equipped for either center type work, collet work or chucking work. Drive to the spindle is through a variable speed transmission in the base, giving stepless spindle speeds up to about 550 r.p.m. Such a machine is suitable for finishing leader pins on die sets, broaches and reamer flutes, cylindrical gages, draw mandrels, pump pistons and shafts, motor armature journals and even small crankshaft bearings. Because of the rapidity of the action, production costs are decreased in many instances by the use of the Superfinishing process.

Vertical Broaching Units

A NEW line of single ram vertical Hydro-Broach machines is announced by the *Cincinnati Milling Machine Co.*, Cincinnati, supplementing

BELOW

FOSTER unit Superfinishing heads are made for mounting on the compound of an engine lathe cross slide. Special heads may also be had for attachment to boring mills and grinders. Attachments have been successfully applied on reamer and broach work. Variable reciprocating motion of the abrasive stick is obtained through the Hi-Cycle motor mounted at an angle. The tool is lowered to the work by rack and pinion actuated by the hand lever at the right.

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THE Superfinishing technique is now available to industry generally through the introduction of Foster's general purpose machine suitable for finishing cylindrical work up to 4 in. diameter and 18 in. in length or 6 in. diameter on shorter pieces.

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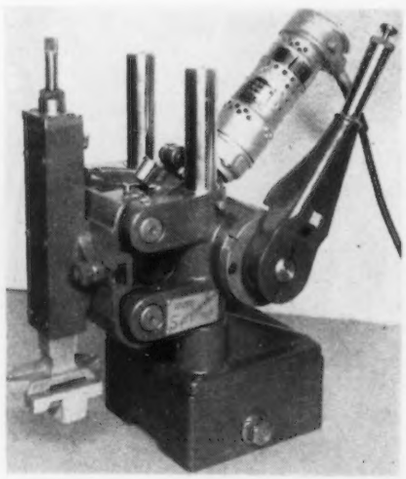

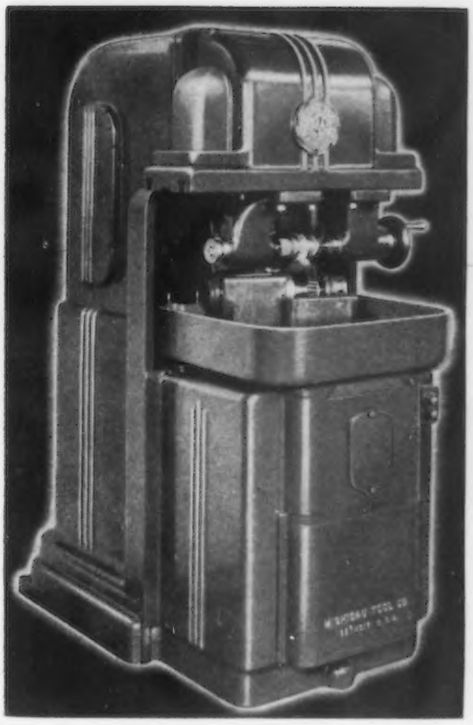

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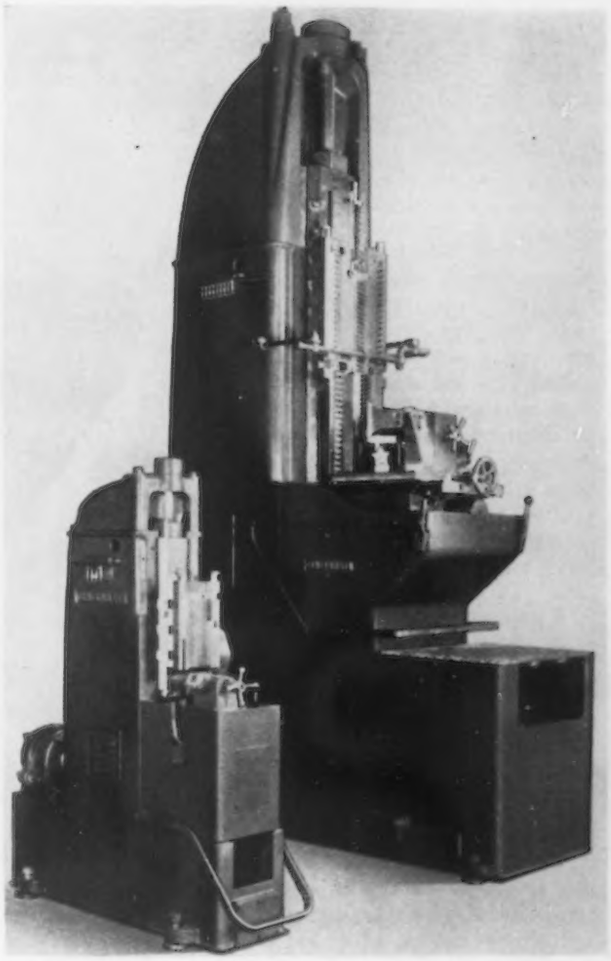
SUBSTITUTION of Cone worm gears for spur gears in the drive train is said to have reduced the power requirements and increased the accuracy and finish of the product from the Michigan 860 rotary gear finishing machine.



AT RIGHT

THE new line of Cincinnati single ram vertical Hydro-Broach machines is made in 12 standard sizes ranging from 1 to 15 tons capacity.

its line of duplex vertical broaching machines and special purpose horizontal types. The single ram models are built in 12 sizes ranging from the No. 1-18, with 18-in. ram stroke and 2000 lb. normal pressure, to the No. 15-60, with 60-in. stroke and 30,000 lb. broaching force. They are available in either fixed or receding table types. The former are built for single cycle operation, the ram stopping at the end of each stroke. For the receding table type, either full automatic or single cycle operation can be arranged. Provision is made for stopping both types of machines instantly or for reversal at any point of the cycle.

Direct driven, constant displacement pumps power the units. Motors are mounted on the outside for ready access. Automatic lubrication is supplied the hardened ram ways and also the table ways on the receding type machines. Ram and cylinder are cast in one piece of Meehanite for sustained accuracy and long life. Other castings are of the same material. A replaceable steel liner is used for the bore of the cylinder to provide a dense bearing surface for the piston. Standard ram speeds start at 41 ft. per min. forward and 81 ft. per min. return and decrease to 26 ft. forward and 51 ft. return on the largest size.

Improved Gear Finisher

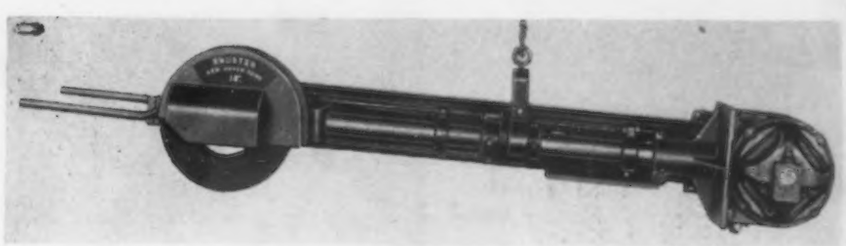
INCREASED gear accuracy and smoother finish are said to have resulted from the incorporation of a number of improvements in the 860 rotary gear finishing machine by the *Michigan Tool Co.*, Detroit. Substitu-

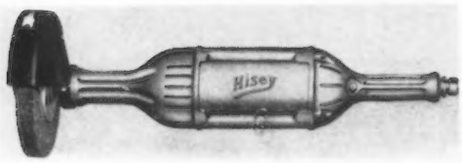
AT RIGHT

COVER thrown back from the new Landis universal grinder headstock drive, showing the compact arrangement of multi-speed motor, V-belts and work spindle.

BELOW

SHUSTER 16-in. motor driven swing frame grinder has V-belt drive from a 5-hp. motor.





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THE Hisey Grind Hog is made in three horsepower ratings for 6 and 8 in. wheels. Motor is a light weight, totally enclosed, fan cooled polyphase type operating on 220 volts.

tion of two sets of Cone area-contact worm gears for 10 gears in the drive train from motor to cutter spindle and table feed has improved smoothness and has made the machine almost noiseless in operation. Efficiency has been increased to the extent that motor requirements have been cut in half. Another improvement is the provision of a 4:1 ratio table lift mechanism, used for raising or lowering the work spindle into proper relation with the cutter spindle. Provision has also been made for indicator attachment to aid in resetting in job lot production of gears. Other changes include the complete enclosing of the machine lubrication system and the use of precision ball bearings throughout.

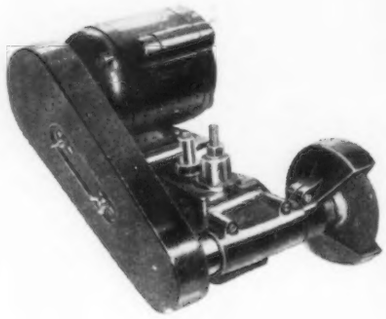
Universal Grinder Headstock

ALL hydraulic universal grinders made by the *Landis Tool Co.*, Waynesboro, Pa., are now being supplied with a multi-speed motor driven headstock of a very compact design that can be used on either a.c. or d.c. circuits. An infinite number of work speeds are available in ranges running as high as 12:1 in some sizes. Dynamic braking is used to stop work rotation automatically. Stopping and starting of the motor is by means of the work and traverse control lever.

Power is transmitted from the motor directly to the spindle through multiple V-belts. Super precision ball bearings are used for the spindle and faceplate. Design is such that faceplate overhang is considerably reduced, and the overall height of the drive unit is considerably less than on former types of drive. The spindle may be made either live or dead and provision is also made for locking the faceplate. Headstock base may be swiveled 90 deg. for face grinding.

Swing Frame Grinder

THREE sizes of motor driven, suspended type swing frame grinders are being offered by the *F. B. Shuster Co.*, New Haven, Conn., the smallest mounting a wheel 16 in. diameter by 3 in. face and the largest a 24 x 3-in. wheel. These machines are intended for heavy grinding work in the foundry or steel mill. Motors range from 5 to 15 hp. and may be of the standard totally enclosed a.c. or d.c. type. Drive is by V-belts covered by heavy sheet steel guards. The grinding wheel runs on heavy duty ball bearings. The unit is supported by a swiveling yoke and can be swung through a complete circle. In addition, it may be tilted and locked in any position about its horizontal axis.



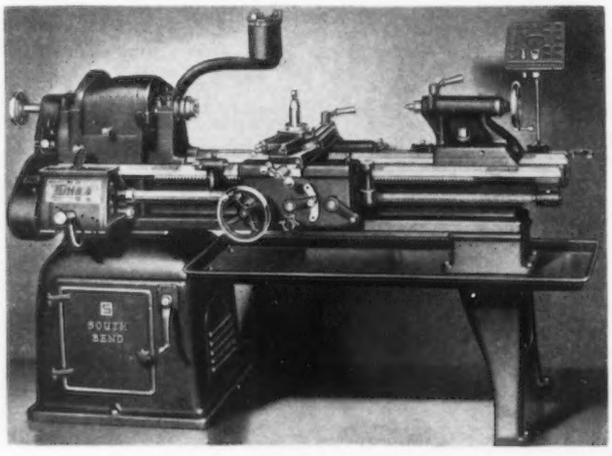
ABOVE

SIMILAR to the No. 7 grinder, the Dumore No. 77 grinder uses the same quills and grinder frame but is powered by a ½-hp. capacitor start, induction run or a constant speed a.c. motor. With V-belt drive and interchangeable sheaves, spindle speeds can be had ranging from 3800 to 7650 r.p.m. suitable for wheels 6 to 3 in. in diameter. The No. 77 is recommended by the maker where the majority of the work is external or for heavy internal grinding.

Portable Grinders

HISEY Grind Hog grinders made in ½, 1 and 1½ hp. sizes for 6 and 8-in. wheels employ a two-pole polyphase motor without commutator or centrifugal switch, involving some patented features covering the use of high flux density with perfected isolation of eddy currents. The weight is said to be half that of a commercial a.c. motor of the same rating. By using high tensile aluminum castings for the housings, the weight has been kept down to 13, 17 and 19½ lb. respectively for the three models, less wheel and guard. Rotors operate on ball bearings, doubly sealed, and are totally enclosed, with forced air circulation around the steel stator shells. Spindle speed is 3500 r.p.m. in all models. These units plug into any 220-volt, three-phase, 60-cycle line. They are made by the *Hisey-Wolf Machine Co.*, Cincinnati.

A NUMBER of improvements have been made in the Power-Plus air grinders made by the *Rotor Tool Co.*, 17325 Euclid Avenue, Cleveland, designed to give greater power, lighter weight, low power consumption and low maintenance costs. The D-100 heavy duty 6-in. grinder, for example, weighs only 9¾ lb. Twin eccentric rotors are used, with a single bakelite blade bearing on each rotor and providing the air seal. Only two bearings are employed on the spindle, one being placed between the rotors. Front and rear handles are heat-treated magnesi-



AT LEFT

THE new 14½-in. swing South Bend lathe is suitable for use in the production department, the tool room and the machine shop.

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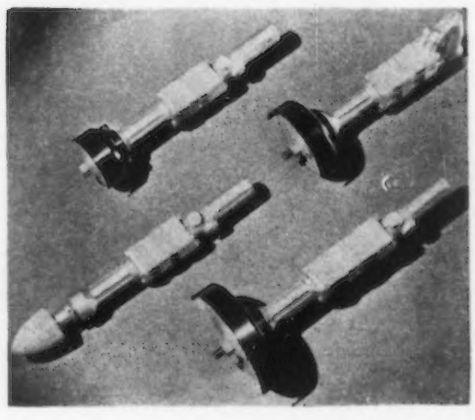
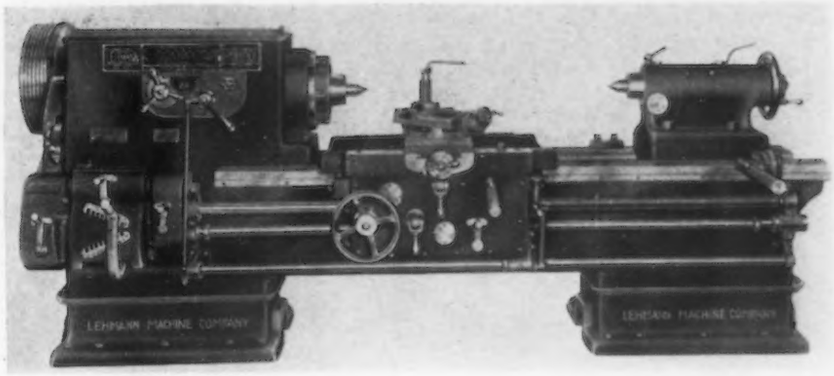
BELOW

TWIN air motors of the single external blade type are used in the new line of light weight Power-Plus grinders made by the Rotor Tool Co.





ABOVE

A SPEED cutting dial is incorporated in the gear shifting control on the headstock of this 24-in. Lehmann Hydratrol heavy duty lathe.

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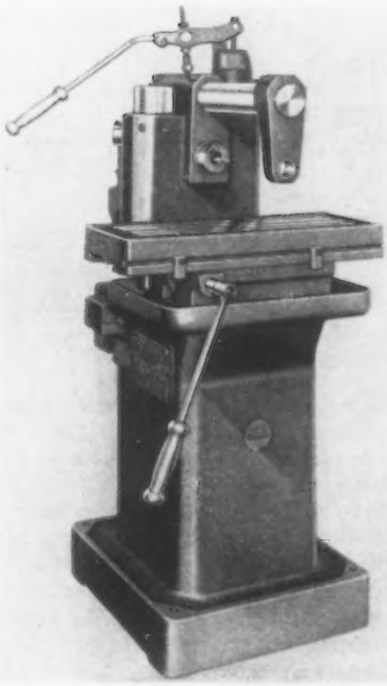
AT RIGHT

TWO cylindrical posts support the head of the Kent-Owens No. 1-M hand miller for light and medium work.



um castings. New blades may be substituted to bring back the tool to full power simply by removing a cover plate and without disassembly of the entire tool. Another feature is the new multiport governor, which holds the free speed with prescribed limits irrespective of air pressure, but which quickly opens under load.

Four models of the Rotor Power-Plus grinders are made: D-75 for cone and 4-in. wheels and the D-80 for 4 and 6-in. wheels, both weighing 8¼ lb.; the D-100 and the D-300, the last for heavy duty 8-in. wheels, weighing 11¼ lb. Free speeds range from 9000 down to 3100 r.p.m. For the D-100 model, 13 and 26-in. extensions may be had. Straight, spade or safety straight handles may be had for all models and these as well as the front handles, center bearing section and end plates are interchangeable on all models, an important maintenance feature.

14½-In. Lathe

A NEW line of 14½-in. swing lathes in bed lengths of 5, 6, 7, 8 and 10 ft. is announced by the *South Bend Lathe Works,* South Bend, Ind. Attachments are available that make this line suitable for either manufacturing operations or tool room work. For the former there are available a hand lever type of draw-in collet chuck, tailstock and double tool slide, besides a turret attachment and four-way tool post. The hardened alloy steel headstock spindle runs in phosphor bronze bearings. Other construction features include a double wall apron, multiple disk friction clutch for operating automatic cross feeds and automatic longitudinal feeds, an improved saddle and compound rest, heavy lathe bed with large box braces made of an iron with 70 per cent steel in the mix, and hand scraped ways for accurate alinement of headstock, carriage and tailstock. The lathes are made in motor drive and countershaft models and in quick change gear and standard change gear types. Spindle speeds range from 22 to 657 r.p.m.

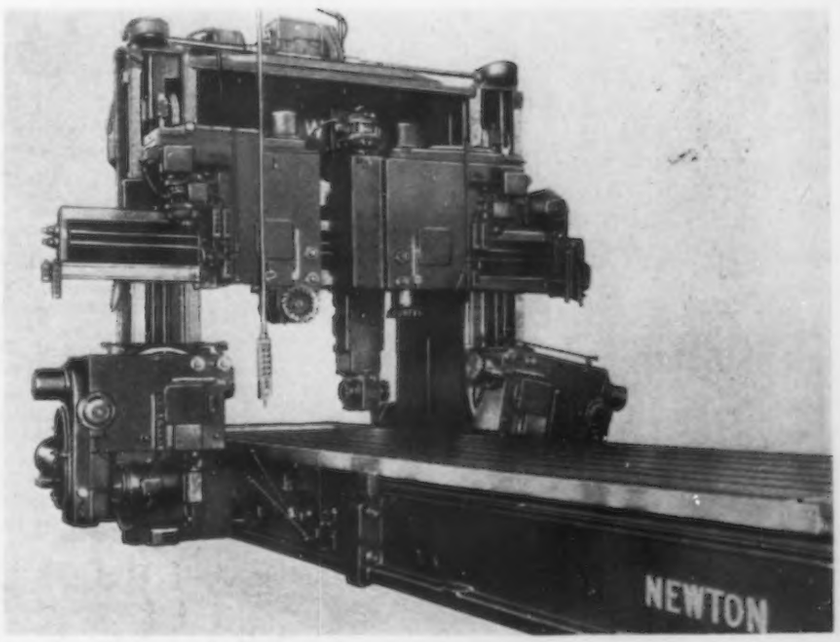
Heavy Duty Lathes

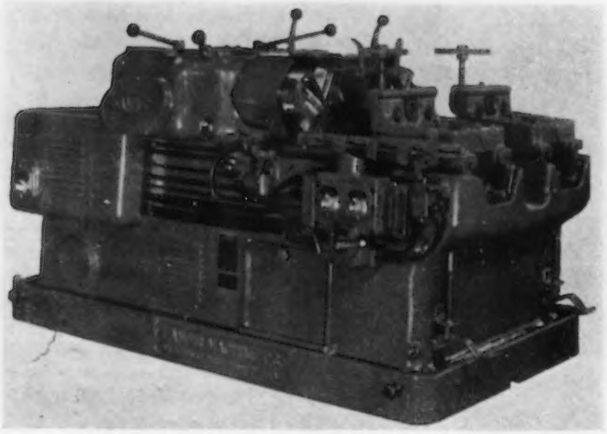
HYDRATROL lathes are now being built by *Lehmann Machine Co.,* St. Louis, in an extra heavy duty type, in 24 and 36 in. sizes. These machines have self-compensating hydraulic clutches and hydraulic primary and spindle brakes. Selection of the 16 spindle speeds is effected by turning a handle on the front of the headstock that at the same time operates a slide rule giving the spindle speed in r.p.m. corresponding to a given linear cutting speed for any diameter work. It also gives a setting for numbered operations. Control of the forward speed, brake and reverse is provided by a handle on the apron and also on the front of the headstock. It is possible to jog the spindle with this control.

Carriage weight is partially sus-

BELOW

IN this Newton D4½-110 unit head planer type milling machine there is combined the flexibility found in general purpose machines with the high productive capacity of a single purpose unit.





ABOVE

THE hydraulic cycle of the improved Lanhydro turning machine has been made more flexible to suit every kind of material and cutting condition and the operation has been simplified.

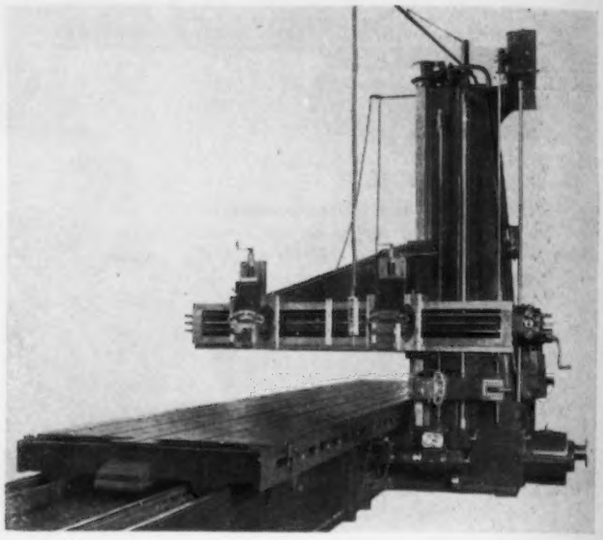
tained on ball bearing rollers as is the weight of the tailstock, but there is always some sliding contact with the bed. Roller bearing rollers are also used to keep the carriage alined on the bed. The apron is lubricated by a circulating pump and a second pump lubricates the cross slide and taper attachment. Anti-friction bearings are used wherever possible, including the quick-change mechanism and its gear train. The headstock spindle is Timken equipped.

Planer Type Miller

MILLING operations on a production basis on a number of different frames and bases of various size diesel engines can be carried on in unit head planer type miller recently built by the *Newton Division* of *Consolidated Machine Tool Corp.*, Rochester, N. Y. Flexibility required for a number of different parts is combined with the accuracy and speed of a single purpose machine. The two horizontal milling heads mounted on the uprights are of the swiveling type, adjustable through a wide arc. The two vertical unit heads mounted on the cross rail are non-swiveling and are so constructed that the extension center head can be bolted to either one of them and the cross rail. A large number of bolt holes are provided for vertical positioning of this auxiliary head with a minimum of overhang. Up and down movement of the cross rail is available for feed of the right angle milling attachment on the left-hand vertical head.

BELOW

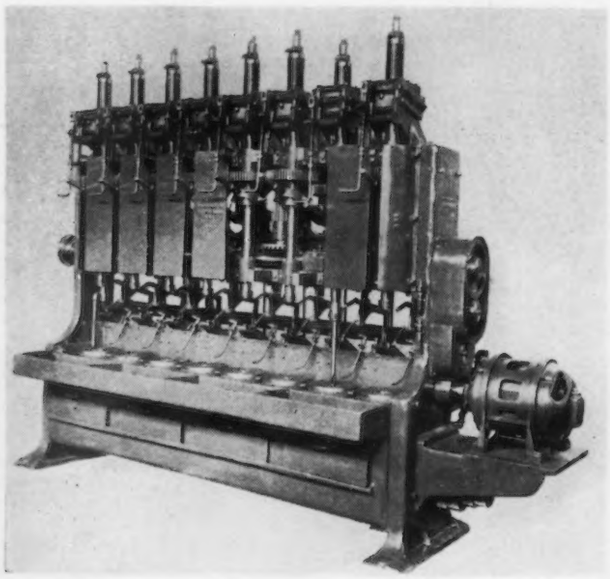
RECENTLY shipped to the New York Shipbuilding Corp. was this 90-ton open side planer with table measuring 6 x 36 ft., the largest of its type produced by the Cleveland Planer Co., Cleveland. Height under the rail is 6 ft. It is driven by a 50-hp. d.c. reversing motor. The planer has a single turn rail clamp, force feed lubrication and power rapid traverse. Cleveland Planer is also constructing a scarfing planer for armor plate work for the same shipbuilding firm.



Feed and rapid traverse is provided each head and the cross rail. Table feed is effected through a rotating screw of large diameter and coarse pitch engaging a stationary nut bolted to the underside of the table. The application of graduated scales, dial indicators and pointers facilitate setting up work and adjusting cutters.

Hand Miller

TWO cylindrical columns or posts carry the head of the new No. 1-M hand miller recently announced



AT LEFT

LEADSCREWS with nuts that automatically open at the completion of tapping operations are a feature of the redesigned Acme 2-in. eight spindle coupling tapper.

AT RIGHT

SEVERAL new features have been incorporated in the new Hi-duty Gaterman tappers, now being made by the L. J. Kaufman Mfg. Co., Manitowoc, Wis. The geared drive mechanism is enclosed in an oil tight housing, with splash and force lubrication supplied. Adjustments to the clutches and other internal mechanism can be made from the outside without removing the spindle or clutch assemblies. Two levers govern the four speed transmission of the No. 5 machine and the six speed transmission on the No. 10. The former will handle 1/4 to 3/4 in. taps in steel and the latter from 5/8 to 1 1/2 in. taps in steel or larger in other materials. Lead screws can be furnished.

by the *Kent-Owens Machine Co.*, Toledo. The spindle is located midway between these posts. The entire head is counterbalanced by means of a long coil spring with self-compensating lever connection, and this counterbalancing is fully adjustable for changes in weight due to tooling, overarm or pendant. Use of the column construction is said to eliminate all tendency to cock the head and to chatter. Only two gear contacts are used between the motor and spindle. Spindle speeds ranging from 100 to 1335 r.p.m can be had through pick-off gears with a 1200-r.p.m. motor. Saddle and knee have been eliminated and the table travels on a fixed bed. Table has a surface 9 x 25 in. and a total movement of 12 in. Three T-slots are provided. Stroke of the head feed lever moves the head 4 in. anywhere within the total range of movement, which is 7 in. Maximum distance from center of spindle to table is 8 in. Spindle runs on two precision taper roller bearings at the front and a preloaded ball bearing at the rear.

THE No. 207 Brown & Sharpe centrifugal Motor-pump is similar to others in the line of pumps for supplying coolant to machine tools and light machinery except that the depth of submergence has been increased to 12 7/16 in. At 1725 r.p.m. these pumps discharge 13¾ gal. per min. at a 4-ft. head or 4 gal. at a 10-ft. head. These pumps may now be had for submergence depths of 6¾, 9 15/16 and 12 7/16 in.

Turning Machine

A NUMBER of improvements adding to flexibility have been made in the Lanhydro hydraulically operated turning machine originally announced two years ago by the *Landis Machine Co.*, Waynesboro, Pa. (THE IRON AGE, June 17, 1937, p. 63). This is a modification of a duplex head threading machine in which hollow milling cutters are substituted for threading dies. The operating cycle is now controlled by a foot pedal, leaving the operator's hand free for loading. After a new piece is inserted in the vise on the carriage, but not clamped, the operator starts the cycle by depressing the foot pedal. The carriage then advances rapidly until the work is about to engage the traveling work center located within the turning head. At this point the forward movement of the carriage is reduced to permit the work to be guided onto the center, after which final clamping is performed. The carriage then advances rapidly until the work enters the turning head, a coarse feed being used from then on. All points of the cycle may be selected to suit the length of work. Shoulder work is handled as before, with a very fine finishing feed.

SERIES 668 S & H No. 0 universal segment type spring coiler will handle wire from 0.004 up to 0.028 in. diameter and 24 in. long on the standard model.

Pipe Coupling Tapper

LEADSCREWS with nuts that automatically open after the pipe coupings have been tapped is one new feature of a completely redesigned 2-in. eight spindle coupling tapper recently announced by the *Acme Machinery Co.*, Cleveland. Air chucks, automatically valved by the downward movement of the spindle, relieve the operator of much manual effort. The tap is lowered to the work by hand, the action locking the leadscrew nut. Upon completion of the tapping operation, the chuck is valved and the nut opened, allowing the counterbalanced spindle to return to its upward position with finished coupling on the tap shank. When the shank is filled with couplings, it is uncoupled from the spindle and the work emptied into a convenient chute. A new type of quick acting ring socket permits unloading while the spindle is rotating.

Speed changes of the spindles are obtained through pick-off gears. When taper couplings are tapped, the machine is equipped with air operated scroll type, roll over chucks and collapsible taps are used.

Segment Type Spring Coiler

PRODUCTION up to 200 springs per min. from wire ranging in size from 0.004 to 0.028 in. is now possible with the newly improved No. 0 universal segment type spring coiling machine built by *Sleeper & Hartley, Inc.*, Worcester. Standard wire feed is 24 in. but may be increased up to 36 in. on sizes up to 0.020 in. through adaptation of special auxiliary gearing. Inside diameter range of springs is 1/32 to 11/32 in. Pitch and diameter cam controls are readily accessible through a recessed cabinet on the front side of the machine. Both cams may be shaped, timed with relation to each other and affixed to the cam hub which is handled as a unit. One piece solid cams can also be used on this removable cam hub. Rapid and micrometer adjustment of compound blocks facilitates set-up. Ball bearings are used on all rotating shafts.

This model No. 0 may be had with three types of drive: motor and variable speed transmission drive; variable speed motor pulley drive, and flanged pulley and clutch drive.

HANDLING and dispensing of a coil of metal band saw is simplified by means of the Doall precision saw carton, introduced by Continental Machines, Inc., Minneapolis. All Doall saws of 100 ft. or over are packed in this way. A cellophane covered window shows the amount of saw remaining in the box. Since there are about 300 different types of narrow blade band saws available, the company has developed a five-letter identification code which is plainly marked on the box.

NUT THREAD *Tolerances* AND *Gaging*

HOW accurately can nut threads be produced commercially? How are nut threads measured? What is a truncated gage? How does it affect inspection? What accuracy of threads is required in service? These are among the many questions presented to nut manufacturers daily, and they were answered as specifically as possible by W. C. Stewart, technical advisor to the American Institute of Bolt, Nut, and Rivet Manufacturers, in an address recently before the Institute at Cleveland. An extended abstract of this address follows:

The use of a male and female thread to hold parts together is one of the principal inventions of mankind. It is barely a century since these products were laboriously made by hand and fitted to one another, the only gaging being done by the feel of the man who fitted the parts together. Great credit is due to those older manufacturers who did such a good job with the limited tools and gages at their disposal.

The tremendously rapid advance of invention and manufacture brought with it an expansion in the use of bolts and nuts to the point that they early became one of the principal mass-production parts and as such it became absolutely essential that they be interchangeable, not only as to parts made by one manufacturer, but as to those made by all manufacturers. To provide this necessary interchangeability, specifications for thread dimensions and methods of gaging have been developed which were intended to be used universally.

Over the last few years there has been an increasing interest in the subject of nut thread tolerances and gaging on the part of both manufacturers and users of nuts. There has been a good deal of misunderstanding as to what degree of thread accuracy may be produced economically and what is really required to provide satisfactory service. Very little trouble has been experienced with nut threads in service, but it has been realized increasingly that present theoretical specifications of thread tolerances, especially with recent changes in gaging practice, do not represent either what is actually produced or what is needed for satisfactory use.

Before considering the question of standard tolerances for nut threads in detail, it might be well to point out some of the manufacturing limitations encountered in tapping nuts. Nuts are tapped in a variety of machines with the use of solid taps. Since taps, for practical reasons, are made solid, there can be no adjustment of dimensions of the tap, such as is possible in producing external threads with adjustable dies. The accuracy of nut threads, therefore, is limited by the variations encountered in commercially available taps. The only practicable way to reduce this variation is to sort taps. This cannot be done by direct measurement of the tap, but must be done by trial and error, that is, by selecting taps from a commercial lot which, under the particular conditions encountered, produce threads within the desired limits. This, of course, is an expensive process because of the loss in rejected taps and the loss in production time while experimenting.

In addition to errors in nut threads resulting from inaccuracies in commercial taps, there are variations due to the process of threading. In commonly used tapping machines, a series of nuts is continuously threaded over a more or less flexible tap, the cutting end of which is not rigidly held, but which floats and centers itself as best it can through the series of nuts, the only support coming by reason of the nuts being held relatively loosely in a flat-sided passageway. The looseness with which the nuts are held is dependent upon the commercial variation in width across the wrench flats of the nuts. Other factors determining the course of the tap through the nuts, and therefore the accuracy of threads obtained, are lack of parallelism between the top and bottom faces of the nut and inaccuracies in the blank hole. The blank hole ordinarily may be off-center with respect to the wrench flats, may be out of round, may be tapered, and may not be perpendicular to the top and bottom faces of the nut. The accuracy of nut threads, therefore, is limited by the manufacturing variations required in producing the blank nut and by the somewhat random course of the tap in passing through a series of nuts.

The material from which the nut is made also affects the accuracy obtainable. Customarily, applications where close accuracy is specified are those requiring tough materials of relatively poor machineability. In tapping materials of this kind the chips do not clear so well and are more apt to deflect the tap at random and produce oversize threads. Furthermore, the cost of tapping these materials is increased because of the lower rate of

production which must be maintained and the reduced life of the tap.

Besides these random variations in nut threads due to errors in taps and variations in the tapping process, there is a progressive change in nut thread dimensions as a result of wear on the tap. A reasonable tool wear must be allowed in nut thread tolerances in order that an economical life of the tap can be obtained.

From the above discussion it is apparent that nut tapping is not a precision process, nor can it, at comparable cost, produce the accuracy obtainable in external threads on bolts. It is equally true, however, that nut threads are being produced daily by the millions which are entirely satisfactory in service. The problem is to establish standard dimensions that truly represent good practice rather than to fuss for technical accuracy.

It is obviously important that the threads of an interchangeable part such as a nut must be standardized so that they will assemble with bolts wherever made, and without being either too tight for easy assembly or so loose as to result in stripping of the threads under load. It has not been established that closer limits than these produce any improvements in service characteristics, except possibly for some very special applications.

To show how the limits of tightness and looseness are controlled, it might be well to review the geometry of a nut thread as shown in Fig. 1. The form of the thread is V-shaped, with the crest and root of the thread flattened, but flattened more at the crest (minor diameter) of the thread than at the root. The included angle between the thread sides is 60 deg. This figure illustrates the tightest and the loosest nut, the difference between them being indicated in solid black. This black area then represents the tolerance permitted on the thread. The thread is specified by the nominal number of threads per inch and by limits on three diameters, the pitch diameter, the major diameter, and the minor diameter. The pitch diameter is defined as the diameter of an imaginary cylinder, the surface of which would pass through the threads at such points as to make equal the width of the threads and the width of the spaces cut by the surface of the cylinder. For example, in Fig. 1, the distance "a-b" is equal to the distance "b-c". For a basic thread form the pitch diameter would be halfway between the major and the minor diameters, but, since the nut thread is cut off more at the crest, the pitch diameter is nearer to the minor diameter.

It will be noted above that no specific limits are given for the angle between the sides of the thread or the lead (distance a nut moves along a bolt in one revolution). Variations of these elements are controlled by the tolerances allowed for pitch diameter. If errors exist in lead or angle, the pitch diameter of the nut must be larger than the minimum specified, in order that a "go" gage may enter the nut. If errors are excessive, the pitch diameter required in the nut to permit entrance of the "go" gage will exceed the maximum permitted by specifications and the nut will be rejected by the "not-go" gage.

Thread limits have been standardized and published in a pamphlet of the American Standards Association which has replaced former specifications published in the National Screw Thread Commission reports. These standards provide for several classes of tolerances designated as Class 1, Class 2, etc.

The only published guide to gaging is contained in the final (1933) report of the National Screw Thread Commission which, in its introduction to the section on gages, says:

"The art of measuring screw threads has developed very rapidly during the past two decades. This development still continues, so that it would be inadvisable to attempt to specify any definite method as standard for this purpose. The objects are to establish the fundamentals of this subject, and to point out practices now successfully used."

Since the publication of this report, work has been carried on by the American Standards Association's sectional committee on the standardization and unification of screw threads, but due to the controversial nature of certain questions, no American Standard system of gaging has yet been published. The work carried on has of course been on the general subject of gaging screw threads of all kinds and not particularly on the gaging of nut threads.

The purpose of gaging is to insure

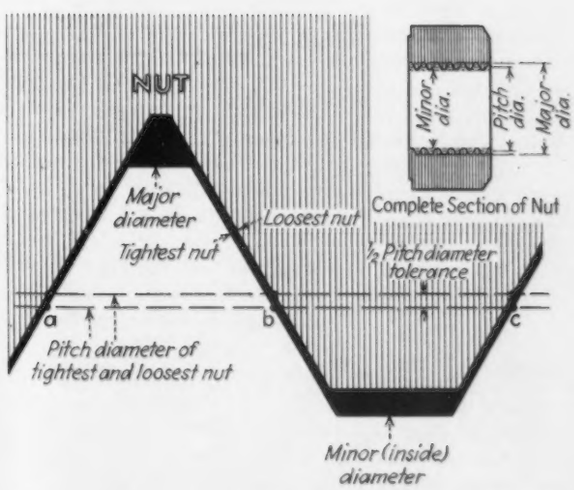


FIG. 1—Nut thread form and tolerances. The black area shows tolerance allowed.

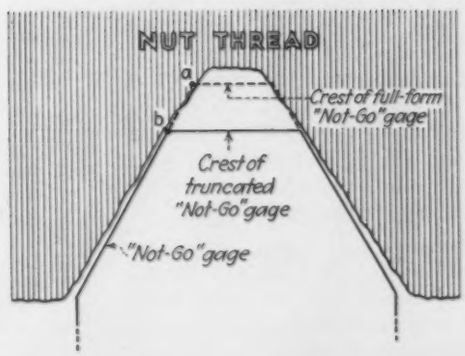


FIG. 2—Effect of truncation of the gage produced by a difference in angle between the gage and the nut thread.

that the nut thread will assemble properly with standard bolt threads. A "go" gage is used to prove that the nut is not too small to assemble. This gage, which is a plug having threads accurately made to the minimum dimensions of the nut thread, must enter the nut all the way if the nut is to be satisfactory. Successful interchangeable manufacture has been carried on for many years with the use of "go" gages only. The reason for this is that the maximum limits of the nut, which determine its looseness, are satisfactorily controlled by the tap itself. With the use of properly made taps, the nut cannot be materially larger than the tap, and as the tap wears the nut becomes smaller until it is too small to receive the "go" gage, at which point the tap is discarded. Gaging in this way is entirely satisfactory for the great bulk of nut production. This is especially true since the maximum limits of the thread are ordinarily of less importance than the minimum limits as evidenced by the fact that far more service difficulties are the result of nuts being too tight rather than too loose.

"Not-Go" Gage Used

With the advent of the specifications for various classes of tolerances, however, it became necessary to use a "not-go" plug gage to prove that the nut thread is not larger than some arbitrary maximum limit. The "not-go" plug gage is made to the maximum limits of the nut and should not enter the nut more than an arbitrary limit of 1½ turns on inspection. It should be noted in connection with the use of "not-go" gages, that the "not-go" limits of nut threads are neither as important from a service standpoint, nor as susceptible to accurate measurement by plug gages, as are the "go" limits. If an accurate "go" gage enters the nut all the way, it is known positively that no element of the nut thread is too small since this gage checks all elements of the thread. No such definite knowledge is obtained from the "not-go" gage since it checks only one element, namely, the point at which interference between the nut and the gage thread occurs.

The design of "not-go" gage described in the 1928 report of the National Screw Thread Commission, which has been in common use and which may be referred to as the full-form gage, has thread dimensions following the profile of the standard screw thread, except that the crest of the thread is cut off so that the outside diameter of the gage thread is not greater than that of the "go" gage. The crest of the thread was cut off to insure that the required interference between the "not-go" gage and the nut will occur on the flank of the nut thread and not at the crest which may be rounded slightly due to wear of the tap. This gage has been customarily used for those special applications of nuts which require that the maximum size of the thread be closely controlled.

Recently there has come in to some use a "not-go" plug gage referred to as a "truncated" gage. This gage was described in the 1933 report of the National Screw Thread Commission and differs from the full-form gage in that the crest of the thread is cut off or "truncated" considerably more than was that of the full-form gage. The intent of this gage design is to insure that the required interference with the nut thread occurs not only on the flank rather than the crest of the thread, but at a point closer to the pitch line, so that the gage will measure more nearly the pitch diameter. It has been found that with the use of the truncated gage many nuts are rejected which would have been passed if the full-form gage were used and which are satisfactory from a service standpoint.

The amount of truncation of the crest of the truncated-gage thread is 16⅔ per cent of the basic thread height, applied from the outside diameter of the "go" gage. However, since the pitch diameter of the "not-go" gage is larger than that of the "go" gage by the amount of the pitch diameter tolerance, the actual amount of truncation is greater than 16⅔ per cent and is greater for the looser classes of tolerances, being 24.1, 21.9, and 20.4 per cent for Classes 1, 2, and 3 tolerances, respectively. This is illogical since the greater accuracy resulting from the truncation of the thread should not be applied in a greater degree to the looser classes of fit. Since the accuracy of measurement by the truncated gage depends inversely upon the height of the gage thread above the pitch line remaining after truncation, it would be more logical to establish limits on this dimension and make them uniform for all classes of tolerance.

Truncated Gage

Truncation of the crest of the gage thread would have no effect on rejections of nuts if both the gage and nut thread were perfect in thread form. This perfection, however, is impossible to maintain either in the gage or the nut thread for reasons given previously. The thread element which is principally responsible for the effects of the truncated gage is the angle. The half-angle of the gage thread may be in error by 15 min., and that of the tap may be in error by 45 min. It is possible, therefore, to have a difference in thread half-angle between the nut and the gage of 1 deg. due solely to errors in the gage and the tap. This difference is increased by the fact that the nut-thread angle tends to be larger than that of the tap due to the wobbling of the tap and the nut during tapping. It is apparent therefore that the average nut-thread angle is apt to be slightly larger than 60 deg. and that the difference in angle between the gage and the nut in normal practice may be as much as 2 deg.

The effect of truncation of the gage produced by a difference in angle between the gage and the nut thread is illustrated in Fig. 2, which shows a nut thread in irregular outline and with a thread angle differing slightly from that of the "not-go" gage. Both the full-form and truncated "not-go" gages are illustrated. It may be noted that the nut thread interferes with the full-form "not-go" gage at the point "a", so that the nut is acceptable to the full-form gage. With the truncated gage, however, no interference takes place, there being a clearance at point "b", and the nut would be rejected. In any lot of nuts, generally accepted by the full-form gage, there will be a large percentage that will be rejected by the truncated gage.

Standard Suggested

It is claimed that the use of the truncated gage insures that the thread angle is more nearly correct. This is true to a limited extent and in a statistical way, but is not necessarily true for particular cases. The use of this gage really means that, if an error exists in the angle of a particular nut, then the pitch diameter must be proportionately smaller than it would have to be for a full-formed gage, if the nut is to pass inspection. The nut, therefore, will not necessarily be rejected unless the error in angle is very great and the required reduction in pitch diameter is such that the "go" gage would reject the nut.

The above analysis agrees with actual tests which have been made on nuts. For example, the ASA sectional committee, through a subgroup, tested a series of nuts with both full-form and truncated gages, These nuts were taken from several stocks of nuts which were specified as Class 2 fit. The percentage rejections obtained with Class 2 gages were 24 and

(CONTINUED ON PAGE 98)

KEROSENE USED FOR SPINDLE LUBRICANT

PROFILOMETER readings on the journal surfaces of the Norton kerosene lubricated spindles indicates an average surface roughness of only 1 to 2 micro-in.

BEGINNING June 1, all grinding machines built by the Norton Co., Worcester, will have kerosene lubrication of the grinding wheel spindles. The spindle journals are finished to a highly reflective, mirror-like surface, accurate in size and straightness to 0.0001 in. and reading from 1 to 2 micro-in. surface roughness on the Profilometer. Improvements in surface finish produced and in the performance of the wheels are said to accrue.

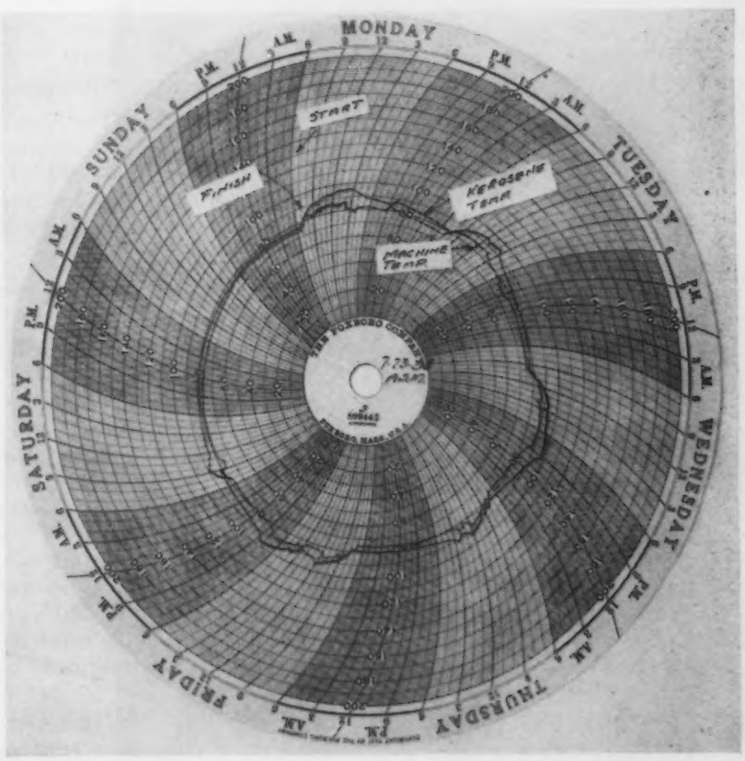
While kerosene has been used for many years as a spindle lubricant in high speed internal spindles supplied with Norton tool and cutter grinders, a high quality oil with a Saybolt viscosity rating from 60 to 185 sec. at 100 deg. F. has heretofore been used for external grinder spindles, which operate at speeds ranging from 800 to 1800 r.p.m., depending upon the wheel size. A clearance of 0.001 to 0.002 in. was provided for the oil and a bearing temperature of about 140 deg. F. was considered normal.

Since December, 1936, tests have been conducted in the Norton laboratories and in the field on kerosene lubrication. The most marked result of these tests is that with much closer fits, the increase in lubricant temperature is only 9.4 per cent over room temperature on the average. The charts show comparative temperature ranges of machines and lubricant, using oil in the one instance and kerosene in the other.

With the kerosene lubricated journals, an improved finish can be obtained, accuracy bettered and production often increased. In an automobile plant, finish on the part was improved, for example, and production increased 12 per cent. Conversely, a softer wheel can be specified with no loss in production and at no increase in wheel consumption. In one instance, the number of pieces per dressing was increased from 35 to 50. In an aviation motor plant the operator increased his production and held his job to a limit of 0.0001 in. where formerly it had been 0.0002 in. Ordinarily production increases average 10 per cent, other conditions being the same as before.

o o o

LUBRICANT temperature chart, using kerosene for the wheel spindle. The lubricant temperature fluctuates only slightly and at no time does the temperature exceed 100 deg. Thus, the repetitive expansion and contraction of the wheel unit elements is greatly reduced. With a high quality oil a comparative test has shown maximum lubricant temperatures of 140 to 144 deg. F.



MEET THE MAN

WHO MADE IT!

PROBABLY by this time, you have discovered and unfolded the impressive chart entitled "Machines and Progress," which accompanies this issue as an inserted supplement.

It is hard to see how anyone could examine this chronological record of machine development without coming to the firm conclusion that progress is machine made. That employment is machine made. That wages are machine made. And that the machine is our only stepladder to a higher standard of living.

We believe that you will agree with us, after examining this chart, that it forms one of the most powerful and convincing expositions of the beneficial characteristics of time-saving machinery that has as yet been published. Here you can follow the creation of employment, working through the seeds of invention, fertilized by time-saving machinery and culminating in mature and growing industries employing thousands upon thousands.

And now for the man who originated and perfected this admirable portrayal of "Machines and Progress."

He is Leighton A. Wilkie, president of Continental Machines, Inc., Minneapolis.

Mr. Wilkie is 39 years old. That is rather a short time in which to chalk up a record such as he has made. If his next 39 years are as fruitful, he will surely set a hard pace to beat.

After studying mechanical engineering and business at the Universities of Minnesota and California, Mr. Wilkie entered the statistical department of Halsey-Stuart & Co., Inc. Here he charted and analyzed the diversification of bond investment of banks and institutions. After this, he traveled for a year in the Orient, South America and Europe.

Next, he started business as the Wilkie Machine Works, in Winona, Wis. Here he manufactured and marketed a line of automobile reconditioning tools and garage equipment.

Mr. Wilkie first placed the "DoAll" contour machine on the market in 1935. This was pioneered as a die making machine and later sold as a shape cutting machine. It utilized narrow precision saws developed by Mr. Wilkie which are tough enough to cut any material. He also developed an interchangeable file band which makes it possible to finish shapes after cutting them out.

Mr. Wilkie is the winner of the Lincoln arc welding contest prize in the classification of "machine production." He also holds patents on devices used in die making and stamping, particularly for small lot production. Some 500 concerns in this country as well as many abroad, have been licensed by him under these patents.

He has a hobby of collecting ore specimens which result from his operation of a silver mine in New Mexico. He breeds pure blood Guernseys on his estate outside of Chicago, where he also developed a new process for preserving grass silage.

Mr. Wilkie plays polo and, for relaxation, sails in his schooner on the Great Lakes.

Complete Tests of Welded Plate Girder Model

COMPLETION in England of successful tests of an all-welded model of a plate girder which will contribute to a better understanding of many engineering problems encountered in building the full size all-welded structures employed in skyscrapers, bridges, ships and houses is reported by the welding research committee of the Engineering Foundation, New York.

Data obtained from the tests are important, it is pointed out, because of the increased demand for all-welded structures in prefabricated homes, low cost housing projects, shipbuilding and other forms of construction. This trend is attributed to the fact that the all-welded structures are lighter, cheaper, and as strong or stronger than the riveted type.

Most important result of the tests from the point of view of the building industry was the substantiation of the belief in welding circles that external loading releases, in a considerable degree, residual strains and stresses in correctly designed all-welded mild steel structures, according to the report.

SCHEDULES KEPT BY WELDING

By IRA B. YATES
General Sales Manager, Wilson Welder & Metals Co., Inc.

o o o

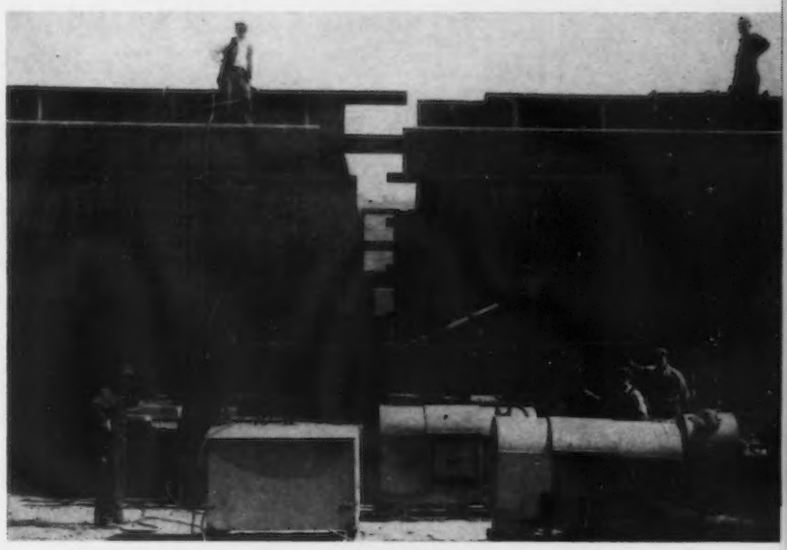
TWO years ago, when the Dravo Corp., Pittsburgh, erected a new shop at its Neville Island shipyard to weld steel hulls under cover, and equipped it with specially designed material handling and conveying apparatus to produce the effect of a production line assembly, all this was regarded in shipbuilding circles as a bold venture.

Experience over 24 months of operation has shown the plan to be sound and far-sighted. For one thing, the preference of buyers for welded construction has been growing by leaps and bounds. In 1933 all hulls built in the shipyard had been riveted. In 1934 about 15 per cent were welded, and the percentage increased each year, reaching 97 per cent in 1937. Another fact which corroborates the good judgement behind the idea of making all conditions favorable is that the total elapsed time of construction of standard river barges — due to ability to work night and through stormy weather—has been decreased approximately 50 per cent.

Illustrative of the advantageous use of good welding facilities is the successful completion of a recent order for 10 barges that were longer than the assembly shop itself. The shop is only 210 ft. in length and the dimensions of the barges were 280 x 48 x 11 ft. Since there was a penalty clause in the contract, it was important to do all the work possible in the assembly shop so as to be sure of good working conditions at all times. The builders erected approximately two-thirds of each of these barges in the shop and the other third in the barge yard. Work was scheduled so that the part erected in the yard would be ready when the longer portion was brought out from the shop. The sections were then lined up and pulled together by means of steam boat ratchets, making one complete barge. Top photo shows shop and yard assemblies ready for joining, and middle photo shows an erection view of the cargo barge. The scheduled delivery date was met with days to spare.

The efficiency of under-cover construction is due to the fact that a very simple erection plan can be used, without danger of congestions being caused by bad weather conditions. In the main assembly bay, which is 91 ft. 5 in. by 207 ft. 5 in., hulls move transversely across the shop as the work progresses. When ready for launching, they are brought lengthwise, on specially constructed carriages, to transfer tracks outside the shop, then moved transversely again to the launching ways.

Adjoining the main assembly bay is a pre-assembly bay 63 ft. wide, in which large sections of the hulls are fabricated. The bottom photo shows a side wing box section of a bottom dump scow turned over for position welding. These dump scows are 206 x 40 x 14 ft. in size, with a capacity of 1200 cu. yards. About 14,450 lb. of electrodes are used on one hull. The scows have a longitudinal trough through the center so that the cargo when dumped will not foul the scow. All photos shown are by the Dravo Corp.



THIS WEEK ON THE ASSEMBLY LINE

By W. F. SHERMAN
Detroit Editor

. . . World Automotive Engineering Congress is center of interest in Detroit . . . W. S. Knudsen outlines trends and points to new auto design possibilities . . . Production at 1939 low point of 32,445 units because of strike and holiday . . . Breach widens in Briggs strike as CIO battle with Martin assumes new importance.

DETROIT—Last week in Detroit a large part of the industry turned out to attend meetings and to take part in an automotive engineering session that was literally "on wheels." Most of the working week after the holiday on Tuesday found automotive engineers and "brass hats" taking part in a series of visits to plants, laboratories and proving grounds in company with delegates to the World Automotive Engineering Congress of the Society of Automotive Engineers.

Production plant shut-downs, occasioned because it was a holiday week and because of strikes, threatened to disrupt the program for a while, but the variety of plant and laboratory activity in Detroit made it possible to follow much of the original schedule for the three days that 150 visiting automotive engineers were in the city.

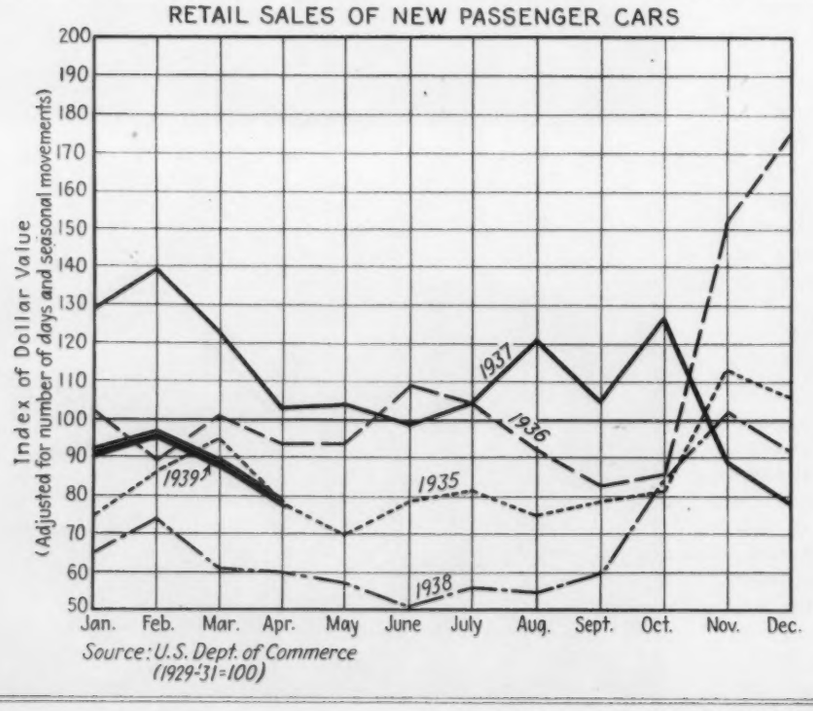
Found Plants Idle

The Congress, which got its start in New York on May 22 and then migrated to Indianapolis for the Decoration Day races, started its tour of Detroit last Wednesday and left here to travel to San Francisco for concluding sessions. For three days the foreign delegates and SAE members had the opportunity to see, feel and hear some of the most hidden secrets in the auto research field. Practically no door was closed to them during the Congress' visit to the city.

Under the general chairmanship of W. B. Hurley, SAE vice-president, Detroit Edison Co., bus loads of engineers started off at an easy pace by visiting the vast acres of Greenfield Village and the Dearborn Museum of Henry Ford, who served as honorary chairman of the Congress. All of the engineers were guests of the Fords, Henry and Edsel, for lunch at Dearborn Inn. They were welcomed in the name of Ford Motor Co. by A. G. Colton. Then the first possible hitch in plans came to light. Ford, in common with many other manufacturing plants, had closed most of its works for the entire holiday week. But the metallurgical and physical laboratories and two of Ford's newest units, the tire plant and the glass plant, were operating, so the visitors saw this phase of the Ford operations and encircled the Rouge plant enroute.

Because the Briggs strike was not settled and Plymouth had been forced to close, the Chrysler Corp. substituted a visit to the production research department at the Jefferson Avenue plant where Superfinish developments have been carried on. Here D. A. Wallace demonstrated and explained the equipment and process. Then the visitors moved northward across the city to the mammoth new Dodge Truck Plant where visitors got their first view of American mass production and assembly operations. K. T. Keller, Chrysler president, and Carl Breer, and O. R. Skelton, Chrysler engineers, addressed the engineering Congress at lunch.

Then the visitors began to rub elbows with some of the fundamental research in the Chrysler engineering laboratories. This section, seldom opened to visitors, held open house for



Source: U.S. Dept. of Commerce (1929-31=100)

the afternoon. While no details could be mentioned, the engineers had a chance to peer into the insides of Chrysler's new fluid drive in a laboratory where many units of the new oil-filled flywheel are undergoing tests; saw the workings of a new front wheel brake; a three-station machine for determining friction of Super-finished parts, and numerous developments in engine and chassis which must remain "off the record" as they were intended to be.

The final day of touring took in the General Motors Proving Grounds at Milford, Mich.—another beehive of research activity which very seldom throws open its gates to visitors. On its 1300 acre test place, General Motors displayed its laboratories, garages and maintenance equipment, "the house of silence" where everything from a tiny radio loudspeaker mechanism to a complete car or diesel engine can be tested to determine noise characteristics, and its 23 miles of varied types of roadway. Visitors were taken in cross country busses over all of the test roads and hills except the major climbs (27 per cent grade was a little too steep) and got a ride around the 3.8-mile speed loop on the same track with cars doing a hundred miles an hour or more.

Session on Metallurgy

The one big technical session of the Detroit part of the Engineering Congress took place in the Proving Ground auditorium with A. J. Schamehorn, head of the Proving Ground, as chairman. The meeting was distinctly metallurgical in flavor with talks on "What is New in Heat Treating Methods, Materials and Processes" by E. F. Davis, Warner Gear Co., and "Developments in Malleable Iron Practices and Their Automotive Applications" by two members of the Malleable Founders' Society, Enrique Touceda, of Touceda Laboratories, and J. H. Lansing.

William S. Knudsen, General Motors president, was the principal speaker at a banquet Friday evening at Hotel Statler and was introduced to a group of more than 500 automotive engineers by Chrysler's president, K. T. Keller.

"There is not room in my imagination to forecast what the ultimate (in automotive design) is—you might say that the sky is the limit, as motor, transmission and axles lend themselves to constructive forward research," Mr. Knudsen declared. Picking out some of the work which might be done to improve automobiles he said, "It might be considered banal for me to remind you of the old-fashioned oil stove carburetor which produced nearly 100 per cent of combustion with no adjustments whatever if the oil was of a fair grade and quality. The interior of our cars are the envy generally, of foreign manufacturers, but even here it seems to me that we could devise simpler means of accomplishing some of the functions first. Rubber cushions show some promise and I feel that window regulators could be made much more efficient, and consequently lower in cost. The formidable array of buttons on the dash could also be, in my mind, redesigned to reduce the number and the cost; and both the radio and the heater are too bulky and too expensive. The development of accessories has shown very good progress but I am sorry to say that the over-all cost of a complete accessory equipment for a car is all out of proportion to the cost of the car itself."

Discusses Trends

After pointing the engineers toward lighter engines, Mr. Knudsen declared that the trend in transmissions is definitely toward over-drive, both automatic and manual. The fluid fly wheel "is just a question of cost" he said.

This outstanding leader of automotive industry made numerous other references to design trends that are of more than passing interest:

"Engines in the rear . . . seem to have reached an impasse . . . the independently sprung rear axle . . . is surely in the picture. In the body-frame combination there lies the greatest possibility for weight-saving and, of course, cost-saving, too . . . It seems to me that some way could be found to combine the body underpan with the frame in one piece and accomplish substantial weight savings . . . With the progress made in welding processing this would seem a reasonable assumption.

"From the manufacturing side," Mr. Knudsen said, "you will have the assistance of much improved technique—the advance in broaching, boring, drilling and milling is quite substantial and we are gradually getting closer to the old adage of drilling a round hole straight and milling the square corner true.

Output at 1939 Low

"I think I should also mention what I consider noteworthy progress in the

(CONTINUED ON PAGE 105A)

THE BULL OF THE WOODS — BY J. R. WILLIAMS

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THIS WEEK IN WASHINGTON

. . . Steel industry asks free speech for employers, protection of "right to work" in Wagner Act . . . President still opposed to amendments . . . Justice Department gets slow returns on second TNEC steel questionnaire.

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By L. W. MOFFETT
Washington Editor, The Iron Age

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WASHINGTON — Declining to give out details, Secretary of Commerce Harry L. Hopkins told the press that the group of eight members of the Business Advisory Council which he took to the White House last Friday night discussed "many things" with the President in a friendly talk of an hour or more. Mr. Hopkins said the discussion was given over largely to the relationship of labor, business and the government, centering around the National Labor Relations Act. He withheld proposals made for amending the law. He also said he received no indication that the President is in favor of any amendment to the act, an observation that led to the belief that the conference really got nowhere.

Subsequently, Mr. Hopkins declared that while many of those present at the White House did not agree with the administration's fiscal policy they were "not so far apart" from the President on a labor policy, a statement which, it was held, could not be reconciled with his remark that he had no indication that the President is favorable to any revision of the act.

Suggestions Offered

The conclusion has been drawn that the President remains firmly opposed to any changes or at least important changes in the act. On the other hand the group which called on the President made suggestions in a three-page memorandum in favor of important revision of the act. An unintentionally dramatic touch to the conference was given when President Charles R. Hook of the American Rolling Mill Co., chairman of the council's labor committee, left the White House before the meeting was ended to broadcast an attack on the law, which he said is responsible for prolonging the depression and is "biased and one-sided."

Mr. Hook had arranged for the broadcast before he was informed that he had been selected to attend the White House conference. Views Mr. Hook expressed in his broadcast are said to have reflected the sentiment of the advisory council. Mr. Hook declared that until there is a substantial amendment of the National Labor Relations Act, and the powers of the labor board are limited and defined there can be no reasonable expectation of any lessening of industrial strife or any appreciable improvement toward more stable labor conditions, with its resultant effect upon business recovery and employment.

Among other members of the council who attended the White House conference were Chairman E. R. Stettinius, Jr., of the United States Steel Corp., President Gano Dun of the White Engineering Co., and President John D. Biggers of the Libbey-Owens-Ford Co.

After saying he "might have suggested" the meeting, Mr. Hopkins refreshed his mind to say definitely he had proposed to the President that the latter invite the business men and that the President asked them to dine with him "to go over the whole gamut of our economic" system.

Because of a sinus infection the President was unable to take dinner with the council members but he afterwards conferred with them. The President, Mr. Hopkins said, indicated he would like to have further conferences with council members and other business men. Mr. Hopkins also disclosed plans for White House conferences with other groups, probably farm and labor leaders. The conferences, he indicated, will consider government fiscal policies, use of credit to promote business recovery, aid to small business and the entire relationship of government to business and other groups.

Giving weight to the opinion that the White House had no intention of supporting recommendation for important, if any, changes in the labor law was the statement by Mr. Hopkins that the President did not "have to accept" changes proposed by the business group. With a touch of satire, Mr. Hopkins said he felt that the council members who called at the White House did not necessarily have "any more wisdom about what ought to be done than a group of labor people, or of farmers or of the unemployed for that matter."

But back of the purpose of the White House business conferences as stated by Mr. Hopkins is said to be a bit of Admiinstration political strategy with a bearing on the 1940 Presidential campaign. The Administration obviously realizes the importance, if not the necessity, of recovery if either it or an approved successor is to be successful at the polls. Consequently, it is maintained, the Administration is again playing for business favor, yet unwilling to yield, except possibly on minor points, to business suggestions, fearing that to do so would alienate support of larger voting groups. It is also believed that Mr. Hopkins in bringing about the conference with members of the Business Advisory Council, whose reports have heretofore been ignored by the White House, was trying to offset the unfavorable reaction from what amounted to repudiation by the White House of Mr. Hopkins' business "appeasement" speech in Des Moines, Ia. The recent appointment of Dr. William M. Leiserson as a member of the labor board reputedly was designed to allay business criticism of the board membership and the President is reported to have referred to the appointment hopefully to this end. The attitude of the business group, however, is understood to have been that no one member could satisfy their complaint against the board.

Again recording himself heartily in

"LIGHT CONDITIONING reduces errors ... saves money in our plant"

says **J. J. WITENHAFER,** *Auditor*
The Lake City Malleable Company

"ONE of the results of light-conditioning our plant," according to Mr. Witenhafer, "has amazed us. Giving the men plenty of good light, we have found, reduces errors, saves us money. Another point: A man who can do a good job under ordinary lighting can do a better job, with less effort, under good lighting."

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favor of the Administration's fiscal policy, despite opposition of the business group, Mr. Hopkins projected the view that it is important and essential to business that with the national income where it is, the government must provide funds in the form of credits and grants.

On the other hand, he said, he will never believe that business by and of itself will get the national income of production up to a reasonably satisfactory point. He said that productive capacity now being worked could be substantially expanded to produce goods without expending any great amount of capital for plant expansion.

In his broadcast, Mr. Hook said that the enlightened employer of today has long realized that factories have become so large and the working organization so complex that the right of employees to unite and speak as a unit for what they think would better their working conditions is entirely fair and just.

The labor act, Mr. Hook said, does not represent the calm, unprejudiced, carefully prepared type of legislation that such an important national problem deserves and requires.

ICC Urged to Cut Rail Rates to West on Rods

WASHINGTON — In a report made public last Saturday, Examiner William A. Disque recommended that the Interstate Commerce Commission grant the request of transcontinental rail carriers to reduce rates on iron and steel wire rods, in carloads, from defined territories, generally east of the Rocky Mountains, as far as the Atlantic seaboard, to Pacific Coast terminals, without observing the long-and-short haul clause. The proposed and present rates, in dollars per gross ton:

	Proposed	*Present*
Baltimore	$17.10	$25.52
Pittsburgh	17.10	19.43
Toledo, Ohio	15.25	17.70
Birmingham, Ala.	13.40	15.73
Chicago	13.40	15.73
St. Louis	12.75	15.73
Kansas City	12.10	15.73
Minnequa, Colo.	9.60	12.10

The examiner said that the traffic most definitely in sight is that of the Colorado Fuel & Iron Co. He stated that shipments are expected from its mill at Minnequa to its subsidiary, the California Wire Cloth Co., South San Francisco, Cal. The company urged that a reduced rate from its Minnequa plant was necessary to meet foreign competition.

The proposed report would require that the recommended authority to reduce the rates shall not apply to routes more than 33 1/3 per cent longer than the short tariff route from and to the same points.

More Freight Cars on Order Than Year Ago

WASHINGTON — Class I railroads on May 1 had 6391 new freight cars on order compared with 4867 on the same day last year, and 6502 on April 1, 1939, according to the Association of American Railroads. New steam locomotives on order on May 1, 1939, totaled 61, the same as on May 1, last year, and 62 on April 1, 1939. New electric and diesel locomotives on order on May 1, this year, numbered 23, compared with 10, one year ago and 33 on April 1, 1939.

Replies to Justice Department's 2nd Steel Questionnaire Delayed

WASHINGTON—The Department of Justice is disappointed at the slowness of returns being made by the larger steel companies to the questionnaire the department has sent to the industry in connection with the investigation by the Temporary National Economic Committee. The delay probably will make it necessary for the department to curtail its steel inquiry. The view is taken that since it is requiring so long a time to get complete answer to the first questionnaire, which deals with prices and distribution of 10 principal steel products for February, 1939, it may be possible only to get returns before the investigation ends from a similar questionnaire covering a single month in 1937 and 1938. Should this prove to be the case, the department will be compelled to forego sending out a questionnaire on distribution for the years 1936, 1937 and 1938.

Data-Gathering Expensive

Practically all of the small steel companies and several of the larger independent companies have replied to the first questionnaire and the same groups have largely responded to the second one. The largest companies, however, are finding it a heavy task, involving much time and expensive clerical help to prepare the necessary data from their records. They also attribute delay to pressure of business demands and to the limited hours they can engage their staffs on the work without paying overtime.

The delay in making returns appears now to confirm a previous view that the department will not be able to present any steel evidence prior to the time TNEC takes a summer recess. No date has been set for recessing but indications are that it will be Aug. 1, at least, before the committee quits for the summer. It had expected to recess late in June or early in July but has loaded its pre-recess schedule with four important inquiries, relating to insurance, cartels, construction and oil. Even if the investigation of these subjects is fairly thorough, some members of the committee doubt that it can complete the job before the end of August. However, legislative members of the committee, having political fences to look after, are expected to insist on recessing within the next six or eight weeks.

After the Department of Justice completes its steel case, executives from the industry will be called both for the purpose of answering committee questions and to present on behalf of the industry replies to such charges as those made by the Federal Trade Commission which, as was to be expected, renewed allegations that the industry is monopolistic and maintains rigid prices. The commission largely blamed the basing point system for these so-called practices. It again urged elimination of the system and the substitution of an f.o.b. mill system.

Cut Answered Charges

The recent break in the steel price structure was an eloquent, if painful, answer to the commission charges. Nevertheless, this biased government agency undoubtedly will continue to insist on its own position as a matter of face saving, to say nothing of at-

tempting to justify appropriations and the jobs they provide. There are those even in the government who think the FTC steel case before the TNEC was so poorly prepared, violently presented and so distorted that it injured the commission's position and actually strengthened the industry's stand.

It is reported that the Department of Justice study will, for instance, show to be utterably untenable the commission's easy contention that elimination of Pittsburgh differentials on June 7 last year had no effect in competition. The data already submitted are said to reflect narrowed mill returns and restricted markets arising from intensified competition, as the result of the elimination of the differentials. Flat rolled products in particular are said to have been affected, and because of concessions on extras and quantity discounts, reports have it that there was a wide spread between quoted base prices and net returns.

In the absence of complete returns from questionnaires there has been no effort made, so far as is known, to determine conclusively the effect on the price structure of the elimination of differentials. While this sweeping move in pricing policy is held in some quarters to have been an important element in developing sharp upsets in the market, it is realized that an outstanding cause was a shrinkage in demand and putting many companies in the red. The recent readjustment of prices is expected to give more stability to the market. At the same time, there is considerable speculation as to whether the industry will be in an entirely satisfactory position unless there is a substantial pickup in tonnage requirements, or capacity is adjusted through mergers or otherwise, such as developing a better balance in demand and reducing the number of specifications. Meanwhile, according to reports coming to Washington, the industry is considering further changes in its price and other policies as a means of improving its position.

Government Supervision

It is not known here how widely the sentiment prevails but in view of the industry's criticism of growing governmental regimentation, surprise has been occasioned at suggestion of some form of government supervision over the industry. These suggestions vary, from proposals for some sort of a code to even broader control. These views, however, are held generally to be not only those of a decided minority but also to reflect a temporary apprehension that would not prevail under normal conditions in the industry. The majority opinion clearly is that the industry's problems are internal and must be solved within the industry rather than inviting a chaotic, paralyzing condition by fumbling, dictatorial government bureaucracy. One thing may be stated with certainty. If ever there is another attempt at government participation in running the industry it will be distinctly different from that exercised under the NRA code. Instead there definitely will be much more government and much less industry control.

In any event, it is believed that testimony before the TNEC will develop interesting and important views on problems of the industry and proposed solutions.

Keystone Steel & Wire Co., Peoria, Ill., declared a dividend of 15c. a share, payable June 15 to stockholders of record May 31. This brings the total dividend payments for the current fiscal year, which began July 1, 1938, to 55c. a share.

Government Steel Contracts $863,390

WASHINGTON—Government contracts for iron and steel products, as reported by the Labor Department's Public Contracts Division for the week ended May 27, totaled $863,390. For the same period, contracts for non-ferrous metals and alloys amounted to $43,750 and for machinery, $762,103. Details follow:

Iron and Steel Products

Enterprise Foundry Co., San Francisco, steel castings	$22,000.00
J. Edward Ogden Co., New York City and Bayonne, N. J., turnover doors	83,460.00
Associate Piping and Engeering Co., Ltd., Los Angeles, and Taylor Forge Co., Chicago, fabricated pipe	167,600.00
Truscon Steel Co., Birmingham, Ala., reinforcing steel	11,595.23
Carnegie-Illinois Steel Corp., Chicago, steel, angles	17,984.53
Worth Steel Co., Claymont, Del., steel, plates	21,329.00
Central Iron & Steel Co., Harrisburg, Pa., steel, plates, sheets	122,198.00
Lukens Steel Co., Coatesville, Pa., steel, plates, sheets	73,183.45
American Bridge Co., Inc., Ambridge, Pa., structural steel	58,713.60
Bethlehem Steel Co., Bethlehem, Pa., structural steel	17,943.24
The Ohio Corrugated Culvert Co., Middletown, Ohio, sectional plate arch	21,749.97
The Ingalls Iron Works Co., Birmingham, Ala., steel floating boom	45,750.00
Firth Sterling Steel Co., McKeesport, Pa., dies, drawing	11,284.20
Wire Rope Corp. of America, Inc., New Haven, Conn., rope, wire, steel	29,960.34
The Van Dorn Iron Works Co., Cleveland, collection boxes	48,900.00
Parish Pressed Steel Co., Reading, Pa., storage boxes	10,794.00
Carlisle Foundry Co., Carlisle, Pa., letter boxes	20,564.16
Walter Kidde & Co., Inc., New York City, oxygen cylinder assembly	61,280.00
The Columbiana Boiler Co., Columbiana, Ohio, steel chemical containers	17,101.00

Non-Ferrous Metals and Alloys

Revere Copper & Brass, Inc., Baltimore, Md., tubing, brass and copper	12,103.16
The American Brass Co., Waterbury, Conn., tubing, copper-nickel	17,604.95
The American Brass Co., Waterbury, Conn., tubing, copper-nickel	14,042.04

Machinery

Worthington Pump & Machinery Corp., Holyoke, Mass., air compressors	$19,800.00
Schramm, Inc., West Chester, Pa., air compressors	36,058.00
Davey Compressor Co., Kent, Ohio, air compressors	19,800.00
Gardner-Denver Co., Quincy, Ill., air compressors	26,416.00
Allis-Chalmers Mfg. Co., Milwaukee, Wis., and Springfield, Ill., tractors	30,280.00
Allis-Chalmers Mfg. Co., Milwaukee, Wis., and Springfield, Ill., tractors	13,864.00
General Motors Corp., Cleveland, Diesel Engine Division, Cleveland, engine spare parts	10,540.78
W. F. Hebard & Co., Chicago, tractors	53,305.00
The Cleveland Tractor Co., Cleveland, tractors	10,153.06
The Henry & Wright Mfg. Co., Hartford, Conn., drawing, forming and assembling machine, sub press assemblies	12,341.00
The American Tool Works Co., Cincinnati, engine lathes	25,070.50
The Sidney Machine Tool Co., Sidney, Ohio, engine lathes	27,016.00
Pratt & Whitney, Division Niles-Bement-Pond Co., Hartford, Conn., automatic profiler	10,720.60
Wm. Sellers & Co., Inc., Philadelphia, drilling machine	48,500.00
Cincinnati Milling Machine & Cincinnati Grinders, Inc., Cincinnati, milling machines	10,356.00
DeLaval Steam Turbine Co., Trenton, N. J., pumps, fuel oil	16,267.00
Thomas Machine Mfg. Co., Pittsburgh, dredge pump parts	24,230.06
Caterpillar Tractor Co., Peoria, Ill., earth moving equipment	89,011.00
The Galion Iron Works & Mfg. Co., Galion, Ohio, road rollers	13,947.80
Caterpillar Tractor Co., Peoria, Ill., tractors, bulldozers	23,964.00
Hardie-Tynes Mfg. Co., Birmingham, Ala., butterfly valves	225,000.00
Chapman Valve Mfg. Co., Indian Orchard, Mass., valves, gate	15,463.00

AFL Machinists' Union Certified by NLRB

WASHINGTON — The National Labor Relations Board has certified the AFL's machinists' union as the sole collective bargaining agency for the tool and die makers and maintenance machinists employed by Wilson-Jones Co., Chicago. At the same time the NLRB dismissed a petition filed by the AFL's metal polishers' union.

FTC Criticizes Delivered Price Practice of Automobile Makers

WASHINGTON—Reporting to Congress on the result of its $50,000 inquiry into distribution practices in the automobile industry, the Federal Trade Commission, traditional critic of the basing point system in the steel industry, has recommended that the practice in the automobile industry of charging the purchaser an amount greater than the transportation cost to the manufacturer or dealer be eliminated as "an unjustifiable imposition upon the purchasers."

The report, which recognized that consumer benefits from competition in the automobile manufacturing industry probably have been more substantial than in any other large industry studied by the commission, pointed to what it called "the frequent practice of adding to the factory price a transportation charge to a certain point of delivery based on the published railroad rate," explaining that this transportation charge may be greater than that actually incurred by the manufacturer or dealer, because of differing methods of transportation and delivery.

Pressure Less Severe

Centering principally around the FTC's contentions that restrictions placed upon dealers by manufacturers should be relaxed in the interest of both the dealer and the consumer, the report said that methods of supervision employed were less direct in 1938 than in former years, that "pressure" by manufacturers has been less severe since the inquiry was ordered, and that some of the smaller manufacturers have cited changes in their 1939 contracts with dealers as indicating "a better deal for dealers." The report, however, also suggested that the dealers set their house in order by providing itemized invoices, among other things, for greater consumer protection.

Administration advocates for bringing production more into line with consumption, thereby smoothing out the peaks and valleys of production, through the medium of a Bureau of Industrial Economics will take little solace in the FTC statement that in automobiles outside the lower price class "the nature of the demand is such and consumer preference such a vital element of demand, that it would be difficult not only to fix prices, but also to establish any quota system of production even if the retail dealers could be brought into effective cooperation for that purpose.

"Price competition in motor vehicles is naturally different from that in commodities that are of the same, or standardized description and quality for producers generally," the commission reported. "In the low price class the competition is more in volume than in prices although prices are important."

American Lathes Displace German Products in Holland

WASHINGTON—Buyers of metalworking lathes in The Netherlands are turning away from Germany to the American market because of long delays in obtaining the German product and because the latter's quality is believed by some Dutch buyers to be going down.

In one instance a Dutch purchaser is reported to have ordered an American lathe for $5000 when a German product of similar design could have been purchased at half that price. The report noted that Swedish metal lathes have recently entered the Dutch market. United States exports of engine, turret and other lathes to The Netherlands in 1938 were valued at $289,597 compared with $227,722 in 1937, the report said.

Reich Develops Synthetic Fuel for Diesel Engines

WASHINGTON—Synthetic fuel for high speed diesel engines is being made in Germany on a commercial scale, according to reports received by the Commerce Department. The first large-scale plant for producing the heavy motor fuel has been established by the Steinkohlenbergwerk Rheinpreussen A. G. (Rheinpreussen Coal Mining Co.).

The report said that raw materials used include a mixture of tar oils produced in the coking of bituminous coal and so-called "Kogasin II," a material produced from gasified coke or carbon monoxide and hydrogen. These materials possess special fuel properties and when mixed complement each other in creating what experts in Germany claim to be a superior diesel fuel similar in characteristics to gasoline and benzol when combined in light motor fuel mixtures.

While the output of the new plant is not known, it is expected to be small since obviously the new diesel fuel suffers the handicap of high cost compared with petroleum-derived diesel oil. For giving market protection to the synthetic diesel oil, Germany again raised the import duty last April on foreign diesel oil by 20 per cent which involved an increase in market prices of 10 to 12 per cent.

U. S. Imports of German Machinery Up in April

WASHINGTON—United States' imports of German machinery in April of this year were valued at $1,088,743, a 155 per cent increase over the corresponding shipments in April of last year and the highest monthly total since 1929, according to the Machinery Division, Department of Commerce.

Textile machinery was the most important type of machinery imported from Germany during the month and was valued at $308,683. Of this total, $200,334 was full fashioned hosiery machinery. Other types of machinery imported in sizable amounts were: wrapping and packaging machinery, $104,074; printing machinery, $100,715; cream separators for commercial use, $48,560; shoe machinery, $36,893; sewing machines, $34,059; and engines and parts, $28,404.

The report said one factor accounting for the increased trade was the recent countervailing duties applied by the United States Government to German imports. This caused importers to stock up on machinery and parts before the increased duties went into effect the latter part of April.

U. S. Could Use 21% of Campbell Plant in War Time

YOUNGSTOWN—Discussing the production of war materials, Lieut. Col. Philip B. Blackmore of Cleveland recently asserted here that approximately 21 per cent of the Campbell plant of Youngstown Sheet & Tube Co. could be utilized by the War Department; with 13 per cent of the Brier Hill plant, 18 per cent of Republic Steel Corp. plants here; 12 per cent of Sharon Steel Corp., and 4 per cent of Carnegie-Illinois Steel Corp. These estimates are subject to revision, he told members of the American Society of Engineers.

SHAKEPROOF *Thread-Cutting* SCREWS

"HI - HOOK"
Thread-Cutting Screws
FOR ALL PLASTICS

A specially designed screw with double thread-cutting slot that drives easily and cuts cleanly in even the toughest of plastic materials!

TAP AND FASTEN IN ONE OPERATION!

Because it cuts its own thread in metals of any thickness, this screw fits tighter, holds better, and saves both time and money. Today, Shakeproof Thread-Cutting Screws are widely used in the construction of streamline trains, automobiles, trucks, buses, ships, airplanes, and hundreds of electrical appliances, etc.

also available with PHILLIPS Recessed Heads

STANDARD MACHINE SCREW THREADS!

The fact that these screws are made with standard machine screw threads assures greater thread engagement. Also, should replacement ever be necessary, an ordinary machine screw of the same size may be used. Then, remember that the "spring-action" slot plus a special hardening process is an exclusive Shakeproof feature which makes this screw drive easily and cut a clean thread even in thick materials. Test it yourself—ask for samples of the size screws you are now using—write today!

SHAKEPROOF LOCK WASHER CO.

Distributor of Shakeproof Products Manufactured by Illinois Tool Works

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FREE SAMPLES!

"Fastening SHAKEPROOF Headquarters"

SEMS (Pre-assembled Shakeproof Lock Washer and Screw) . . . Self-Locking Set Screws

Lock Washers . . . Locking and Plain Terminals . . . Spring Washers . . . Special Stampings

British Steel Output Near All-Time High

WASHINGTON — Expansion of steel production in Great Britain in contrast to curtailed production in France is reported to the Commerce Department. The aggregate steel output of Great Britain during March of this year was 1,170,000 tons, almost double the total for last December. The March, 1929, production, it was reported, came within 7,000 tons of the all-time monthly record established in November, 1937.

Since 1934, British steel plant capacity has been steadily expanded and now stands at approximately 14,500,000 tons, a figure only slightly above the production level actually attained during March of this year, according to the report. It was noted that authoritative British economists attribute the expansion primarily to an increase in civil and commercial demand rather than to the rearmament program.

On the other hand, the report from France estimated the country's 1938 pig iron output at 6,049,000 tons, a decrease of 41 per cent below the 1929 level, and the steel output at 6,174,000 or 64 per cent below the 1929 production. The contraction was attributed to retrenchment by the railroads, the mechanical industries and the construction industry. The railroads have constantly reduced expenditures for capital equipment; tool and implement makers are frightened by the international situation, and construction by private enterprise has come to a virtual standstill because of the reluctance to invest in permanent improvements at this time, the report said.

Pittsburgh Gets New Metal Porcelain Plant

PITTSBURGH — Employing approximately 100 workmen, the newly organized Metal Porcelain Products Co. of Pittsburgh is to open a plant late in August or early September at Carnegie, Pa., near here.

According to Mark S. James, manager and secretary, Pittsburgh Commission for Industrial Expansion, the new company, backed by Pittsburgh business men, is a closed corporation capitalized at $165,000. It will manufacture "flat" porcelain products such as store fronts, tunnel linings, and the larger parts for major household appliances.

Chief executives are Milton Gallup, president, and J. C. Rumbarger, vice-president, both formerly with the Enamel Products Co., Cleveland. R. E. Casey, former personnel director of the Enamel Products Co., is secretary and assistant treasurer, and E. L. Resler, assistant controller, Jones & Laughlin Steel Corp., has been made treasurer of the new company.

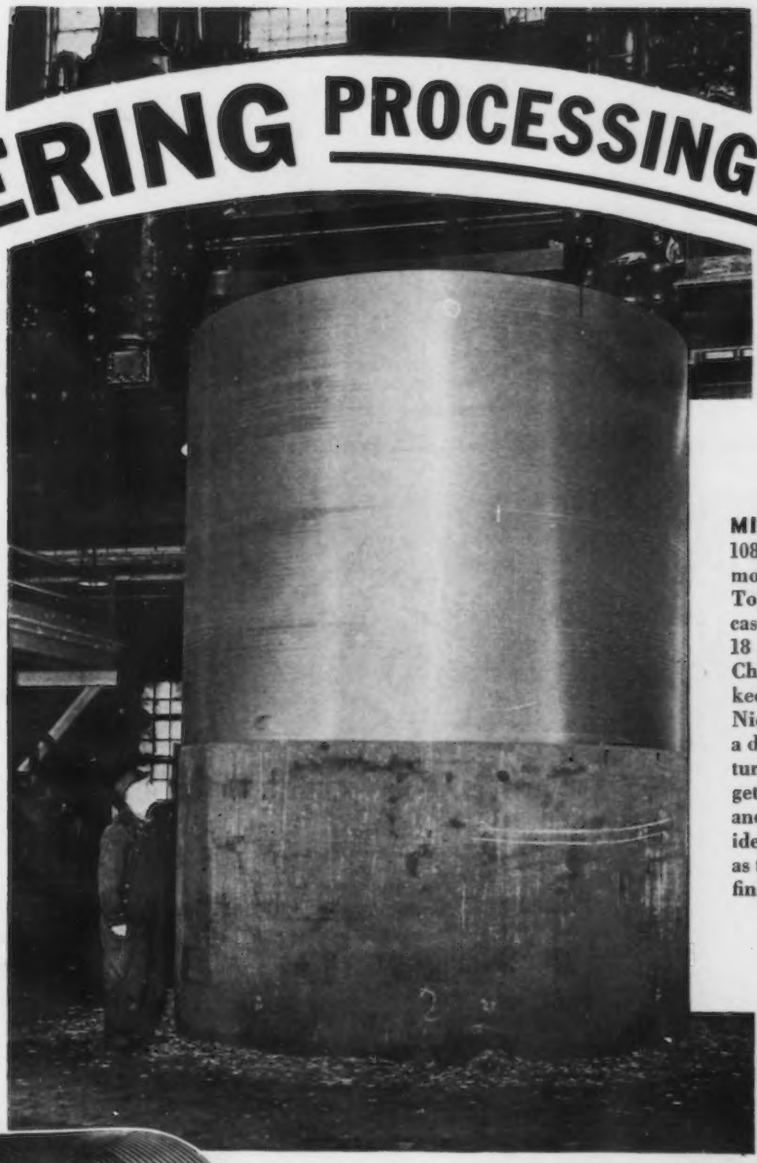
Bethlehem Expands World's Fair Exhibit

UNEXPECTED possibilities of industrial business in the New York World's Fair are evidenced by Bethlehem Steel Co., which this weekend is enlarging the product division at its exhibit to include actual size sections of sheet piling for shore protection, railroad axles and other trade features. Bethlehem reports receiving in the first four weeks more than 60 inquiries from industrial buyers for different types of steel products such as corrosion resisting steel for trays, sheets for special types of stampings and Bethanized wire for the hanging of signs.

LOWERING PROCESSING COSTS

...on GOLD, SEWAGE and PAPER PULP

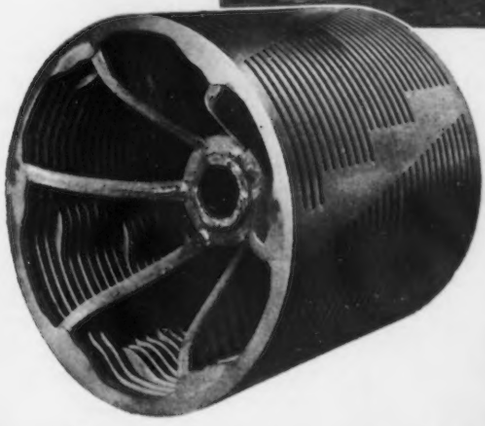
...with NICKEL CAST IRONS



MIRROR-SMOOTH this 108,000 lb. drier shell presses moisture from paper pulp. To assure uniformity in this casting, 12 ft. in diameter and 18 ft. overall length, Allis-Chalmers Mfg. Co., Milwaukee, added 1% Nickel. This Nickel cast iron developed a dense, close-grained structure throughout, which, together with its uniformity and machinability, makes it ideal for such applications as this, where a very smooth finish is required.

*Ni-Resist—Reg. U. S. Pat. Off. by The International Nickel Company, Inc. — #278,180

*Ni-Hard—Reg. U. S. Pat. Off. by The International Nickel Company, Inc. — #281,986



GOLD MINE "IN THE BLACK." Even in gold mines, operating costs must be kept down. Ball mill liner costs were *halved* when the Wendigo mine in Kenora, Ontario, used Ni-Hard,* an exceptionally hard and wear resistant Nickel cast iron, for liners in their ore grinding mill. These liners, cast by the Vulcan Iron Works, Winnipeg, handled more than *twice* the tonnage reached by previous liners of an unalloyed material. Reduce processing costs by specifying Nickel cast irons for hard jobs in your plant. For practical information about money-saving applications of Nickel alloyed materials in your industry, please write to the address below.

LASTS 10 TIMES LONGER. In one service test, Ni-Resist,* the special corrosion-resistant Nickel cast iron, withstood acids and organic compounds encountered in raw sewage 10 times longer than plain iron. To cut processing costs in modern sewage disposal plants, this Comminutor grinder shell is cast from Ni-Resist for the Chicago Pump Co. These precision castings, which withstand abrasive wear stoutly as they do corrosion, were produced by the Challenge Foundry Co., Batavia, Illinois.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N. Y.

Nut Thread Tolerances and Gaging

(CONTINUED FROM PAGE 80)

63 per cent, respectively, for full-form and truncated gages. Unscrewing torque and vibration tests were performed on nuts from the loosest and tightest classes of nuts, but no appreciable difference in results was obtained.

It is evident, therefore, that the use of the truncated gage in place of the full-form gage, in effect, substantially reduces the permissible manufacturing tolerances for nut threads. The truncated gage in principle undoubtedly gives more precise information regarding the pitch diameter of a nut, but, aside from certain technical objections based on the amount of truncation, it also materially increases the rejections of nuts which have heretofore been acceptable both in service and to the full-form gage. It is interesting to note in this connection that the strength of the thread joint between the bolt and the nut is dependent to a much greater extent on variation in the depth of engagement of the nut thread, as controlled by the inside diameter, than on variations in pitch diameter.

In conclusion, it will be realized that the pitch diameter tolerance of nuts, as usually specified, does not represent a variation of which the manufacturer can take full advantage. The available tolerance is reduced greatly by a series of unavoidable losses resulting from errors in taps and gages, truncation of the "not-go" gage, and by the practical necessity of not working too close to the tighter limits of the specification. In establishing commercial tolerances for nuts, therefore, tolerances must be broad enough to encompass these losses, and, in addition, must provide a reasonable allowance for wear on taps and the normal variations occurring even in good tapping practice. It has been shown that nuts have been produced over a period of years under this condition which are satisfactory in service and that closer tolerances are impractical in manufacture and do not offer commensurate increase in quality to the user.

As a solution to this problem it has been suggested that American standard Class 1 tolerances be accepted as standard for nuts. This suggestion is in the right direction, especially in view of the fact that Class 1 gages are available commercially, and would undoubtedly eliminate much of the present technical difficulty between manufacturers and users of nuts. It is not sufficiently established as yet, however, that Class 1 tolerances can be met consistently by the ordinary tapping processes now in use. It is possible that it will be necessary to develop a new class of tolerance for use with nuts only, which will be somewhat broader than the present Class 1, particularly for certain sizes. This is substantiated by the fact that the German tolerances as well as other European systems of tolerances permit variations which are more consistent with good manufacturing practice.

National Steel Pays 40c. Common Dividend

NATIONAL STEEL CORP. has declared a dividend of 40c. per share on common stock for the second quarter of 1939. There are 2,198,967 shares outstanding and the dividend will be payable June 30 to stockholders of record on June 20.

British Steel Sheet Prices Are Stabilized Until Oct. 31

LONDON—The British Sheet Steel Makers' Conference has announced its decision to maintain prices for black and galvanized sheets at current levels until Oct. 31. This decision has been made with the concurrence of the Import Duties Advisory Committee and follows a similar decision on May 15 on the part of the makers of other steel products.

Current prices, which were established last December at £1 per ton below the then existing levels for the first half of 1939, are as follows:

Sheets	*Per Ton*
Black, 24 gage	£14 15s. 0d. ($73.75)
Gal., cor., 24 gage	£17 5s. 0d. ($86.25)

In addition to the December reduction of £1 per ton, buyers of fully finished automobile body sheets were granted a special rebate of 15 shillings ($3.75) per ton with a further rebate for large quantities. Thus the total price concession to big buyers of such sheets is more than £2 ($10) per ton. These concessions will also be maintained until Oct. 31.

The sheet industry is abnormally busy at the present time and under ordinary circumstances prices would have been advanced. However, the present policy of the industry is to keep prices in close relation to costs and not to advance them solely on exceptional demand.

A considerable part of the sheet makers' activity is due to the large government orders for air raid shelters, which are being supplied at special reduced rates.

Dominion Steel Demand Holds

TORONTO, ONT.—Canadian iron and steel markets failed to reveal new developments for the week. Prices remained steady at former levels and local steel interests do not look for any immediate revision. Demand for sheets and bars is holding at a good level with orders running slightly ahead of those reported last month, buying being chiefly from the automotive industry and the electric equipment companies. Reinforcing bars also are moving in better volume in lots of one to two cars and there are several good orders for structural steel overhanging the market. Export business is in good volume and additional contracts are being closed at frequent intervals.

While Canadian steel interests still have hopes for higher operating schedules before the year end, current demand does not indicate there will be a speedy stepping up in activities. Production of ingots and pig iron registered favorable gains during May, and it is stated that further betterment will be revealed for June. Four blast furnaces now are blowing and one banked.

Pig iron markets are showing minor improvement with orders mostly in small tonnage lots from the smaller melters. No large tonnage contracts or forward delivery business has been placed and it now appears that current prices will continue until the end of September. Individual sales are run-

ning around 100 tons. Larger melters in the Toronto area still are carrying large stock piles and are drawing on these for immediate needs. Melters on the Great Lakes are said to be taking delivery of iron in better tonnage than formerly, having the advantage of reduced freight rates for the Summer period.

General unsettlement continues to rule the Canadian iron and steel scrap markets, with demand spotty and prices momentarily soft, but with prospects of some firming in the early future.

Cartel Conference Slated for June

LONDON—A conference of the national comptoirs of the European Steel Cartel is to be held in Brussels early in June, when the Czech delegates will participate for the first time.

It is understood that the agenda refers mainly to an examination of the current delays or advances in respect of the various quotas. Belgium at present has exceeded her quota owing to heavy demands and some adjustments will consequently be required.

The subject of prices does not appear on the agenda, but it is likely to be discussed, especially with regard to the Scandinavian countries. A price advance for these markets may be considered.

With regard to the competition of American independents in the unregulated Oriental markets, it has been decided in agreement with the American producers supporting the Cartel to give the latter full freedom in respect of tonnage prices. The Cartel members have been given permission to make any rate reductions necessary, in addition to the recent cut in the official tariff, wherever outside competition is encountered.

Germany Imports More Metallic Ores

LONDON—In comparison with March, Germany imported approximately $1,850,000 worth more of metallic ores, especially iron, according to official April foreign trade statistics just issued. These figures cover Greater Germany, including Austria, Memel, and the Sudeten Territory. It is stated that trade between Germany and Bohemia and Moravia is no longer reckoned as foreign trade.

The Fredericksen Co., 821 South Water Street, Saginaw, Mich., has changed its firm name to the Saginaw Bearing Co., according to an announcement by Karl A. Agricola, general manager.

Continental Roll & Foundry Acquires Howell Engineering

THE Industrial Equipment Division of the Continental Roll & Steel Foundry Co., East Chicago, Ind., has announced the acquisition of the Howell Engineering Co., St. Charles, Ill., manufacturer of automatic polishing and buffing equipment made under the B. F. Bower patents and patents pending. The engineering, service and sales staffs have also been absorbed.

Complete production of these products which will henceforth carry the name "Continental," will be at the company's East Chicago plant; the Coraopolis, Pa., and Wheeling, W. Va., plants concentrating on the company's products for the steel and other industries, and steel castings in general.

Automatic polishing and buffing machinery includes automatic work holders and chucks for high production polishing and buffing of parts with polishing surfaces on several planes such as vessels and spherical, circular or symmetrical pieces, irregular pieces, small intricate parts and straight or tapered tubing. H. W. Faint will head the sales department of this unit of Continental's Industrial Equipment Division.

Chicago Living Cost Lowest of 30 Cities

CHICAGO—Department of Labor figures on the cost of living for families of wage earners in 30 cities of the United States revealed that during March Chicago held the lowest position. The cost of living for all items in this city was 78.5 of the 1923-25 figure which was based at 100 per cent. The indexes of some of the other cities on all items were Cleveland 85.9, Cincinnati 84.8, New York 83.7, Boston 81.6, Philadelphia 81.2, Pittsburgh 80.6 and Detroit 79.3. These figures were compiled by the Illinois Manufacturers Association.

J. & L. Sells Bus Line At Aliquippa Plant

ALIQUIPPA, PA. — Jones & Laughlin Steel Corp. has disposed of its transportation subsidiary here, the Woodlawn & Southern Motor Coach Co. It has been sold to Wm. F. Baum and associates. The Woodlawn & Southern has been in existence for 12 years and owns 22 buses. Two years ago, Jones & Laughlin abandoned a street car line which operated here.

Industrial Inventories Decline 1.1% in April

SHARP declines both in new orders and in shipments were experienced in April by a cross-section of American industry, comprising 135 manufacturing concerns, according to a confidential survey made by the National Industrial Conference Board. An analysis of the reports received from the 135 companies discloses that the value of new orders received during the month was 14.6 per cent lower than in March, and that value of shipments fell 8.2 per cent. The value of inventories at the end of April, however, declined 1.1 per cent.

Westinghouse Restores Salaries for 8700

IN view of improved business of the company, full restoration of pay reductions for 8700 salaried employees was made June 1, according to George H. Bucher, president of the Westinghouse Electric & Mfg. Co. Salaried employees affected have been receiving 90 per cent of their base rates since June 1, 1938, when reductions for all salaried employees were made in the company's retrenchment move against falling business at that time. Salaried employees receiving less than $125.00 per month were restored to their full rates six months ago.

Allis-Chalmers Still On UAW "Work-Holiday"

MILWAUKEE—More than 7000 manufacturing employees of the Milwaukee p'ant of the Allis-Chalmers Mfg. Co., are enjoying a self-granted work-holiday which is now in its third week. The work-holiday, which is a dignified term for a strike, was suggested by local leaders of the United Automobile Workers of America, an affiliate of the C.I.O. This move was taken in an effort to force company officials to sign a closed shop contract following the cancellation of last year's agreement in April. The question of wages, hours or of working conditions, has not been raised by the union. Thus far, a formal strike has not been called but picketing was in evidence last week at several gates to the plant accompanied by the customary signs, pep music, loud speakers and police protection.

Link-Belt Co., Chicago, has been appointed by the Twin Disc Clutch Co., Racine, Wis., as distributer for Twin disc friction clutches and clutch couplings in all industrial fields.

Statistically Speaking:

Metal Prices in May Generally Lower . . . Plant Operations Also Declined

WITH but few exceptions, the trend of metal prices in May was downward. The break in steel prices at mid-month brought THE IRON AGE steel composite price down to an average of 2.256c. per lb. for the month, the lowest figure since last October. In April the average was 2.286c. and in May, a year ago, was 2.506c. THE IRON AGE scrap composite also moved lower in the month. The average of $14.17 per ton representing a loss of 60c. from the April figure, but $2.63 above May, 1938. The month's drop was due chiefly to weakness in Pittsburgh quotations.

A shortage of nearby supplies caused in prices at New York to rise to 49c. per lb. from 47.16c. in April, the May average being the highest level touched since October, 1937. Copper prices dropped a little over ⅛c. per lb. during the period, while spelter remained unchanged. Lead was off fractionally.

Additional data on industrial productive activities in April received in the past week continued to indicate a general slowing down of operations. Orders for malleable iron castings were off 6814 tons from the March total to 29,183 tons; bookings of steel furniture, shelving, lockers, etc., declined to $1,619,218 from $1,797,839 in March and the production of electric energy, an important business indicator, amounting to 9,776,998,000 kw.-hr., was 5.6 per cent below the March figure. However, the April power output was 11 per cent above the corresponding month of 1938.

Martin Employees At All-Time High

EMPLOYMENT at The Glenn L. Martin Co. aircraft plant at Middle River, Md., near Baltimore, on May 31 reached a new all-time high of 6539, as compared with 2676 a year previous, 3480 six months ago and 5927 on April 28 of this year.

. . . THE NEWS IN BRIEF . . .

World Automotive Congress center of interest in Detroit, where auto production reaches 1939 low at 32,445 units due to holiday and unsettled Briggs strike.—**Page 84.**

Roosevelt still against Wagner Act amendment according to Secretary Hopkins.—**Page 88.**

ICC Examiner recommends cutting of rail rates to west on rods.—**Page 90.**

New freight cars on order 6391 compared with 4867 a year ago.—**Page 90.**

Justice Department finds answers to second TNEC steel questionnaires slow to come.—**Page 91.**

Railroad taxes in 1938 top fuel expenditures by $100,000,000.—**Page 92.**

Government purchases of steel in latest reported week total $863,390.—**Page 93.**

AFL's machinist union certified as bargaining agent by NLRB.—**Page 93.**

Because German lathes are losing in quality, according to some Dutch buyers, U. S. lathes are reported gaining in The Netherlands.—**Page 94.**

U. S. could use 21 per cent of Youngstown Sheet & Tube Co.'s Campbell plant in war time.—**Page 94.**

U. S. imports of German machinery (chiefly textile) advance sharply in April.—**Page 94.**

Reich develops synthetic (but costly) fuel for high speed diesel engines.—**Page 94.**

FTC, critic of steel pricing system, attacks automobile industry's delivered price as frequently an "imposition on consumers."—**Page 94.**

British steel production near all-time high; French output falters.—**Page 96.**

Metal Porcelain Products Co. will open new plant in fall at Carnegie, Pa.—**Page 96.**

Bethlehem Steel expands World's Fair exhibit after getting 60 inquiries in four weeks.—**Page 96.**

British Sheet Steel Makers' Conference will maintain prices to Oct. 31.—**Page 99.**

Demand holds in Canada's iron and steel markets, pig iron gains.—**Page 99.**

European Steel Cartel schedules meeting in Brussels for early June.—**Page 100.**

Germany increases imports of metallic ores.—**Page 100.**

Continental Roll & Foundry Co., East Chicago, Ind., acquires Howell Engineering Co., St. Charles, Ill.—**Page 101.**

Jones & Laughlin Steel Corp. sells bus line at its Aliquippa, Pa., plant.—**Page 101.**

SECTIONS INDEX

MEETINGS

May 22 to June 8—Society of Automotive Engineers, world congress, in various cities.

June 5 and 6—Associated Machine Tool Dealers, Schenectady.

June 19 to 22—American Electroplaters' Society, Asbury Park, N. J.

June 26 to 30—American Society for Testing Materials, Atlantic City, N. J.

Aug. 28 to 31—American Mining Congress, Salt Lake City.

Sept. 20 to 22—National Industrial Advertisers Association, New York.

Sept. 26 to 29—Association of Iron and Steel Engineers, Pittsburgh.

Oct. 23 to 27—National Metal Congress, Chicago.

Living cost for Chicago wage-earners lowest of 30 American cities.—**Page 101.**

Westinghouse Electric & Mfg. Co. restores salaries for 8700 employees.—**Page 102.**

Manufacturers' inventories declined 1.1 per cent in April, according to National Industrial Conference Board.—**Page 102.**

7000 Allis-Chalmers employees, seeking closed shop, continue on "work-holiday."—**Page 102.**

Martin aircraft employment at Middle River, Md., plant, reaches all-time high at 6539.—**Page 103.**

Cincinnati Milling Machine Co. honors 100 "Old Timers" at dinner given by Frederick V. Geir, president.—**Page 105E.**

To Fred T. Llewellyn, U. S. Steel Corp. research engineer, the American Institute of Steel Construction presents a resolution of appreciation.—**Page 105E.**

Building of first air-conditioned blast furnace is under way at Woodward Iron Co. plant, Woodward, Ala.—**Page 105E.**

Cleveland industries honor veteran employees at banquet. — **Page 105E.**

American Iron and Steel Institute takes over technical association research.—**Page 105E.**

Timken-Detroit Axle Co. acquires Delta Mfg. Co., Milwaukee.—**Page 107.**

Domestic scrap consumption runs 71.2 per cent ahead of 1938 rate, while exports decline 20.3 per cent.—**Page 107.**

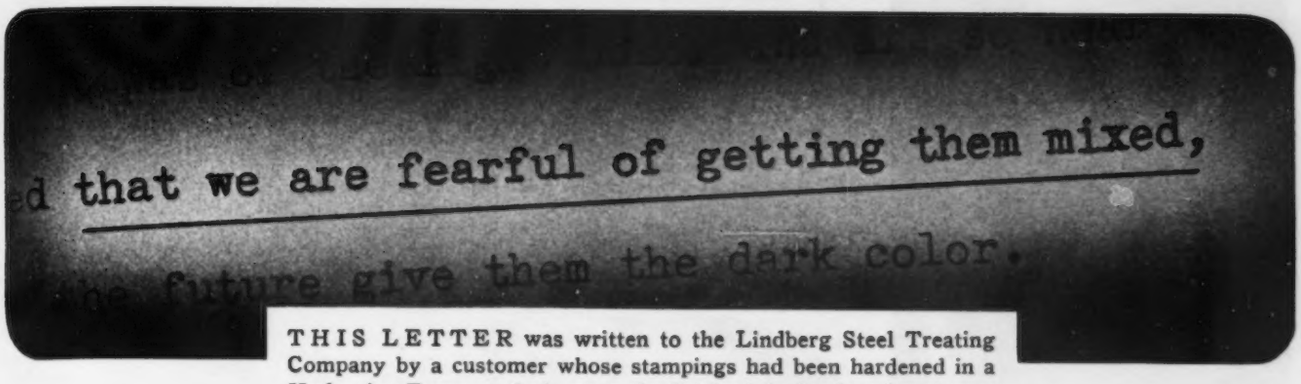
Bell system engineers make cable containing 4242 separately insulated copper wires.—**Page 107.**

Steel payrolls in April total $58,517,000, a 9 per cent decline from May.—**Page 107.**

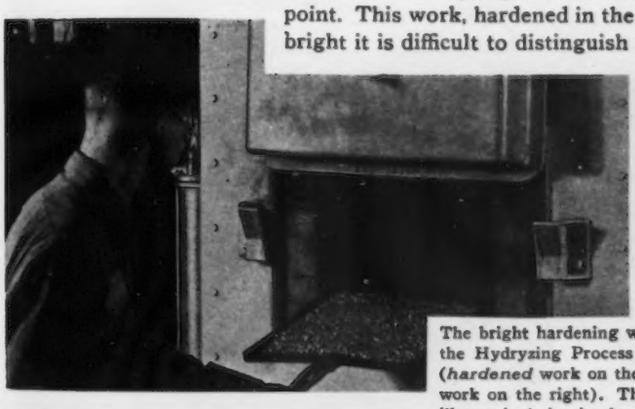
April exports of industrial machinery top like month of 1938 by 4 per cent.—**Page 128.**

April steel exports from U. S. decline 8214 tons to 153,884; Japan continues heaviest buyer of scrap.—**Page 105F.**

BRIGHT HARDENING..*so bright in fact..*



THIS LETTER was written to the Lindberg Steel Treating Company by a customer whose stampings had been hardened in a Hydryzing Furnace. As he says, the finish of the hardened parts was so near that of the un-hardened parts that "he was fearful of getting them mixed." If you are making stampings, springs, screw machine parts, or any small to medium size production items which require heat treatment, chances are you'd like to harden them bright, so as to eliminate pickling, sandblasting, or other forms of cleaning. Cleaning operations not only cost good time and money, but they invariably give the parts a rough finish over which it is impossible to get a smooth plating job, and in addition the scaling of light section work, such as springs, often reduces the section to a dangerous point. This work, hardened in the Hydryzing Furnace, comes out so bright it is difficult to distinguish it from un-hardened work.



The bright hardening work being turned out by the Hydryzing Process is shown in the photos, (*hardened* work on the left and *un-hardened* work on the right). The equipment (upper left illustration) is simple, easy to operate, and is not expensive. Take a minute off **NOW** and ask your secretary to send the coupon for a free packet of Hydryzed samples* and further data.

Lindberg
Hydryzing Furnaces

By the Makers of the
CYCLONE TEMPERING FURNACE

Send for Free Packet of Hydryzed Samples

Lindberg Engineering Company
228 North Laflin St., Chicago.

Please send free packet of Hydryzed samples and further information.

Name .....

Company .....

Address .....

City ..... State.....

*or else send in some of your own parts and we will send them back to you Hydryzed.

AT LEFT

ENRIQUE TOUCEDA, of the Malleable Founders' Society, Cleveland, was one of the featured speakers at the Detroit technical session of the World Automotive Engineering Congress of the Society of Automotive Engineers. He spoke last Friday at the General Motors Proving Grounds, delivering a paper jointly with J. H. Lansing, also of the Malleable Founders' Society, on "Developments in Malleable Iron Practice and Their Automotive Applications."

BELOW

HIGHEST ranking engineers of the United States accompanied foreign delegates on their tour of automotive plants and laboratories. John A. C. Warner, general manager, SAE, and Ralph R. Teetor, past president, inspect a "fifth wheel" used for recording speeds and mileage accurately at the General Motors Proving Grounds. With them is William H. Hoult, superintendent of field tests for the Chevrolet Division at the Proving Grounds.

On the Assembly Line

(CONTINUED FROM PAGE 86)

production of rolled and drawn sections which help materially in the production of our cars."

During this week while engineers were having a postman's holiday by visiting with other engineers in the automotive laboratories, automobile output reached its 1939 low point of 32,445 units, according to Ward's Automotive Reports. This was less than half of the previous week's level, 67,740, and was even below the 1938 level of 32,980. Virtually the entire industry was on a schedule of three days or less due to the holiday and the strike situation. General Motors plants made the best showing of the week, producing 23,670 units against 31,256 the previous week. The Briggs strike held Chrysler volume to 1,100 units, against 5,640 the previous week. Ford was virtually shut down, turning out only 1,600 cars compared with 20,350 the previous week. Plymouth volume was zero, while Chevrolet registered a drop from 19,000 to 14,000.

Settlement of 27 grievances which caused the strike against Briggs was announced Thursday by James F. Dewey, federal labor conciliator, but an end to the strike still is not in sight. The settlement was a decision which ruled 15 points in favor of the union and 5 in favor of the company, leaving 2 in the jurisdiction of the National Labor Relations Board. Five others involving wage disputes were left for settlement in contract negotiations.

The management of the Briggs Mfg. Co. has refused "a thousand times," according to Dewey, to negotiate a new contract until the union-shop clause has been waived by the CIO.

Also, the management insists on waiting until the NLRB designates an official bargaining agent. This brings up again the battle between Homer Martin and the CIO, broached when Martin interfered in the strike nearly two weeks ago. Both the CIO union and the management have agreed to a consent election, but Martin has evaded the issue. Until this impasse is broken the strike seems further from settlement than when it started on May 22. And until it is settled, it will hold up the production of more than 30,000 cars a week and will keep 70,000 employees out of work.

Votes for AFL Link

Martin announced on Sunday that his independent UAW faction had voted, 66,768 to 3,370, for affiliation with the American Federation of Labor. He said that 70,354 votes in all were cast by members in good standing. He claims that the unions total membership, including paid-up and non-dues paying members is somewhere around 200,000. The rival UAW-CIO insists that Martin has fewer than 50,000 members and that more than 300,000 organized automobile workers are still loyal to the CIO. The AFL will return the original charter of the UAW.

May Pig Iron Output Drops 19.2 Per Cent

PRODUCTION of coke pig iron in May totaled 1,717,516 gross tons, compared with 2,056,177 tons in April. On a daily basis output dropped 19.2 per cent from that in April, or from 68,539 tons to 55,404 tons in May, and was the lowest daily output since last August, when production was 48,193 tons. The rate of operation in May was at 40.8 per cent of the industry's capacity, as compared with 50.4 per cent in April.

There were 107 furnaces in blast on June 1, operating at the rate of 60,515 tons a day, compared with 102 on May 1, producing at the rate of 60,160 tons daily. Nine furnaces were put in operation and four were taken off blast. The United States Steel Corp. put five in and banked two. Independent producers put three in operation and took two out of production, and one merchant unit was put in blast.

Furnaces blown in included: One Mystic Iron Works furnace; one Donora, American Steel & Wire Co.; one Duquesne, one Edgar Thomson, Carnegie-Illinois Steel Corp.; two Ensley, Tennessee Coal, Iron & Railroad Co.; one Cambria and one Sparrows Point, Bethlehem Steel Corp., and one Hubbard, Youngstown Sheet & Tube Co.

Furnaces blown out or banked were: one Monongahela and one Lorain, National Tube Co., and one United and one Pioneer, Republic Steel Corp.

Production of Coke Pig Iron and Ferromanganese

Gross Tons

	Pig Iron*		Ferromanganese†	
	1939	1938	1939	1938
January	2,175,423	1,429,085	20,805	22,388
February	2,060,187	1,298,268	18,655	20,295
March	2,394,615	1,452,487	16,008	21,194
April	2,056,177	1,376,141	11,518	18,607
May	1,717,516	1,255,024	7,888	13,341
June	.....	1,062,021	....	14,546
½ year	.....	7,873,026	....	110,281
July	.....	1,201,785	....	20,818
August	.....	1,493,995	....	6,088
September	.....	1,680,435	....	630
October	.....	2,052,284	....	3,621
November	.....	2,269,983	....	13,156
December	.....	2,210,728	....	19,197
Year	.....	18,782,236	....	173,791

*These totals do not include charcoal pig iron.
†Included in pig iron figures.

Merchant Iron Made, Daily Rate

Tons

	1939	1938	1937	1936	1935
January	10,603	10,635	16,106	10,537	3,926
February	9,637	8,854	16,514	11,296	6,288
March	8,951	8,524	16,457	10,831	7,089
April	8,508	8,273	14,517	13,897	8,799
May	7,038	6,431	19,483	12,814	8,441
June	....	5,375	15,870	14,209	7,874
July	....	5,495	19,609	11,619	8,644
August	....	6,614	17,831	12,148	8,194
September	....	11,205	20,065	12,526	10,090
October	....	10,799	18,950	13,645	11,199
November	....	13,208	15,662	14,739	12,503
December	....	9,130	10,964	14,852	13,312

Daily Average Production of Coke Pig Iron

Gross Tons

	1939	1938	1937	1936	1935
January	70,175	46,100	103,597	65,351	47,656
February	73,578	46,367	107,115	62,886	57,448
March	77,246	46,854	111,596	65,816	57,098
April	68,539	45,871	113,055	80,125	55,449
May	55,404	40,485	114,104	85,432	55,713
June	....	35,400	103,584	86,208	51,570
½ year	....	43,497	108,876	74,331	54,138
July	....	38,767	112,866	83,686	49,041
August	....	48,193	116,317	87,475	56,816
September	....	56,015	113,679	91,010	59,216
October	....	66,203	93,311	96,512	63,820
November	....	75,666	66,891	98,246	68,864
December	....	71,314	48,075	100,485	67,950
Year	....	51,458	100,305	83,658	67,556

Production by Districts and Coke Furnaces in Blast

FURNACES	Production (Gross Tons) May (31 Days)	Production (Gross Tons) April (30 Days)	June 1 Number in Blast	June 1 Operating Rate, Tons a Day	May 1 Number in Blast	May 1 Operating Rate, Tons a Day
New York:						
Buffalo	124,196	137,374	7	4,005	7	4,205
Other New York and Mass.	.....	.....	1	545	0	....
Pennsylvania:						
Lehigh Valley	49,692	54,512	4	1,605	4	1,815
Spiegeleisen	4,457	4,415	1	145	1	145
Schuylkill Valley	19,241	15,286	2	620	2	595
Susquehanna and Lebanon Valleys	14,870	16,746	1	480	1	560
Pittsburgh District	309,378	396,247	20	10,420	18	10,825
Ferro. and Spiegel	2,989	5,271	1	95	1	175
Shenango Valley	.....	13,001	0	....	0	....
Western Pennsylvania	47,295	43,272	3	1,945	2	1,250
Ferro. and Spiegel	2,100	3,231	1	70	1	110
Maryland	123,843	121,332	5	4,590	4	4,045
Wheeling District	72,975	95,354	4	2,355	4	2,810
Ohio:						
Mahoning Valley	154,847	187,805	8	5,385	7	5,080
Central and Northern	126,146	173,539	8	4,325	10	5,525
Southern	47,041	47,744	5	1,515	5	1,590
Illinois and Indiana	325,542	411,772	15	11,795	15	12,030
Michigan and Minnesota	72,515	79,877	4	2,340	4	2,185
Colorado, Missouri and Utah	45,837	42,238	3	1,480	3	1,410
The South:						
Virginia	.....	.....	0	....	0	....
Ferromanganese	2,799	3,016	1	90	1	100
Kentucky	14,420	13,224	1	465	1	440
Alabama	157,333	190,921	12	6,245	11	5,265
Tennessee	.....	.....	0	....	0	....
Total	1,717,516	2,056,177	107	60,515	102	60,160

Arthur G. McKee & Co. to Build Inland Furnace

ARTHUR G. McKEE & CO., engineers and contractors of Cleveland, announce receipt of a contract from Inland Steel Co., Chicago, for reconstruction of its blast furnace plant No. 1 at Indiana Harbor, Ind. The present plant was constructed by McKee & Co. in 1907 and produced the first pig iron made in Indiana, preceding production at the Gary plant of the United States Steel Corp. by about a year.

A new and larger blast furnace will be built on the site of the present furnace together with new ore bins and handling equipment, gas cleaning plant plated that work will be completed and hot blast stoves. It is contemabout Jan. 1, 1940.

Lakey Foundry & Machine Co., Muskegon, Mich., for six months ended April 30, 1939, first half of its current fiscal year, shows net profit of $144,573, or 32c. per share, after all charges except Federal taxes, compared with net profit of $10,109, or 2c. per share, for the first six months of preceding fiscal year.

. . . PERSON

C. F. Goldcamp has been appointed manager of sales, cold finished department, Jones & Laughlin Steel Corp., Pittsburgh, succeeding the late J. D. Allen. Mr. Goldcamp's entire business experience has been with Jones & Laughlin, having started with the company in 1923 shortly after his graduation from Lehigh University as a chemical engineer. He started in the inspection department of the Pittsburgh Works and became assistant chief inspector in 1924. He was made chief inspector of the Soho Works in 1926 and in 1930 was transferred to the general metallurgical department as contact man for hot rolled and cold finished products. In 1935 he was made a salesman in the cold finished sales department.

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Richard Rimbach has been appointed technical advisor to R. C. Enos, president of Standard Steel Spring Co., Coraopolis, Pa. He will work on the development and promotion of a new process for coating steel with a pore-free metallic coat for corrosion resistance. Mr. Rimbach was formerly director of research, Standard Steel Car Co., editor of *Metals and Alloys*, and more recently consulting metallurgical engineer.

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O. P. Wilson, heretofore executive vice-president of the Norma-Hoffmann Bearings Corp., Stamford, Conn., has been elected president succeeding W. M. Nones, who has been made chairman of the board. Mr. Wilson continues as treasurer. H. J. Ritter, who has been secretary of the company, has been elected vice-president and secretary, and C. B. Malone, vice-president in charge of plant operations. E. C. Lennon has been appointed assistant secretary-treasurer, and J. J. Jenkins, auditor.

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Guido G. Behn, who left the organization of the Hudson Motor Car Co. in 1929 after having served for nearly 20 years as chief engineer, has been returned to the organization through his election as a member of the board of directors. Mr. Behn is a pioneer of the industry, having been in it since 1902. He went to Detroit in 1906 with the E. R. Thomas-Detroit—later the Chalmers-Detroit Co. In 1909 as executive engineer he joined the original group that founded the Hudson Motor Car Co., among them R. B. Jackson, Howard E. Coffin, Roy D. Chapin and F. O. Bezner. In 1910 Mr. Behn became head of Hudson's engineering department and served in that capacity until 1929 when he retired from active duty to engage in various other enterprises.

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W. L. Weaver has been appointed district sales manager of Allegheny Ludlum Steel Corp.'s New England territory, with headquarters at Springfield, Mass. He formerly was special representative out of the Watervliet, N. Y., office. J. F. Dolan, Jr., previously district sales manager in New England for the products of the tool steel division, was made assistant district sales manager of the New England territory which will now handle all products of the corporation.

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Frederick V. Geier, president of the Cincinnati Milling Machine Co., has been elected vice-president of the Cincinnati Commercial Club. J. B. Doan, chairman of the Board of American Tool Works, was elected to the executive committee of the club.

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J. H. Morrison has been appointed superintendent of the hot rolling operations of Pittsburgh Steel Co.'s Monessen and Allenport, Pa., plants. Mr. Morrison went with the Pittsburgh Steel Co. in 1936 and previous to his present appointment was superintendent of the hot rolling works in Monessen. He formerly was with Sharon Steel Corp.

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Louis M. Hague has been appointed vice-president in charge of sales of Hanson-Van Winkle-Munning Co., Matawan, N. J. C. W. Yerger, formerly vice-president and sales manager has been appointed executive vice-president.

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M. B. McCafferty has been appointed district sales manager of Wheeling Steel Corp.'s new district sales office at Cleveland. Harvey O. Albrecht, who has been Wheeling Steel's resident salesman in Cleveland for a number of years, will be associated with Mr. McCafferty.

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E. T. Eggers has been appointed special representative on wire rope for the Gulf Coast oil fields by American Steel & Wire Co. His headquarters will be in Dallas. An alumnus of Pennsylvania State College, he joined the wire company in 1934.

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George W. Knotts, for many years manager of the Youngstown plant of United Engineering & Foundry Co., has retired at the age of 72. He is succeeded by Ernest E. Tross, for the last seven years general superintendent.

C. F. GOLDCAMP

Mr. Knotts was born in Baltimore. He joined the A. Garrison Foundry Co. as a draftsman at the age of 20. In 1893 he became mechanical engineer for the National Rolling Mills at McKeesport, Pa. About 1901 he joined the Lincoln Foundry of Pittsburgh as general superintendent. Within a short time this foundry became a unit of United Engineering & Foundry Co. Mr. Knotts was appointed district manager of the Frank Kneeland plant and then in 1912 he went to the Pittsburgh office as manager in charge of mechanical operations. In 1917 he was appointed manager of the Youngstown plant.

Mr. Tross recently returned to Youngstown from England where he had completed supervision of the new plant for the Richard Thomas Co.

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W. H. Stewart has been appointed assistant general sales manager of the Davey Compressor Co., Kent, Ohio. Formerly he was Great Lakes district manager.

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J. T. Leach, representative of the metallurgical department, American Steel & Wire Co., sailed June 2 for a six-month tour of South American markets for the company.

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Frank W. Klatt has returned to the W. W. Sly Mfg. Co., Cleveland,

SONALS . . .

as general manager, a position he occupied from 1920 to 1927. After service with one of the large automotive industries, principally in foreign countries, Mr. Klatt spent six years in India.

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N. A. WILLIAMS has been elected vice-president in charge of operations of the Union Pacific Railroad, and OTTO JABELMANN has been elected vice-president in charge of research and mechanical standards. Mr. Williams succeeds HOWARD C. MANN, who has retired, while the vice-presidency

RICHARD RIMBACH

to which Mr. Jabelmann has been elected is a new office.

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WALTER E. BLANCHARD has been appointed operating manager of the National Automobile Dealers Association, succeeding A. N. BENSON, who resigned last February.

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HERBERT H. ROGGE has been appointed manager of Westinghouse Electric & Mfg. Co.'s agency sales department with headquarters in Pittsburgh. He formerly was manager of the syndicate division of the Westinghouse Electric International Co. in New York.

Following four years of general engineering work with the parent company, Mr. Rogge has been associated with the International company since 1926, when he was made special representative in Manila, P. I. He later was transferred to Soerabaya, Java. In 1929 he returned to New York as syndicate representative of the company and was promoted successively to manager, syndicate division; manager, New York sales; and sales manager of the International company.

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G. S. CRANE has been appointed vice-president in charge of sales and engineering of Cutler-Hammer, Inc., Milwaukee. He will supervise the development work of the company as well as the engineering, drafting and patent departments. He has been with Cutler-Hammer for 29 years.

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CHARLES R. HOOK, president of the American Rolling Mill Co., Middletown, Ohio, has been given the degree of Doctor of Commercial Science by Oglethorpe University, Atlanta, Ga.

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W. M. PACKER has been appointed vice-president of distribution for the Packard Motor Car Co. He has been an automobile sales executive for 14 years.

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RAYMOND L. COLLIER, secretary of Steel Founders' Society of America, Cleveland, was elected a director of the Cleveland chapter of the American Trade Association Executives.

C. C. DECK, who has been made superintendent of the Gary works rail mill of Carnegie-Illinois Steel Corp., as announced in these columns last week.

MALCOLM S. ADLER has been placed in charge of the newly-opened Cleveland branch office at 726 Keith Building, of the Buffalo Foundry & Machine Co., Buffalo.

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CLARENCE S. PARKER was honored at a dinner held by the Revere Copper and Brass Foremen's Association at New Bedford, Mass., on May 26 on the completion of 50 years of continuous service with the Revere Copper & Brass, Inc. He started as an assistant to the foreman at the Taunton mills and through a series of promotions was made superintendent of both the Taunton and New Bedford plants in 1920. He is at present serving in an advisory capacity to the Taunton division.

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WILLIAM BLACKIE, who has been a supervising manager with the Chicago office of Price, Waterhouse & Co., has been appointed controller of the Caterpillar Tractor Co., Peoria, Ill.

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C. E. SEARLE, vice-president in charge of sales of the Worthington Pump & Machinery Corp., Harrison, N. J., and HOBART C. RAMSEY, in general administrative charge of operations, have been elected to the board.

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H. T. HAMILTON, treasurer, Carnegie Natural Gas Co., Pittsburgh, will retire on June 1. Mr. Hamilton's continuous service with Carnegie companies has been for 52 years. In 1921 Mr. Hamilton became assistant treasurer of the gas company and in 1938 was made treasurer and a director of the Carnegie Natural Gas Co. and the Apollo Gas Co., subsidiaries of the U. S. Steel Corp.

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C. A. TURNQUIST has been placed in charge of the newly-opened branch office, at 1544 Broadway, Denver, of the Independent Pneumatic Tool Co., Chicago.

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HENRY A. KESKE, comptroller of the Lamson & Sessions Co., Cleveland, has been elected president of the Cleveland chapter of National Association of Cost Accountants.

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JOHN E. JAMES, chairman of the Lancashire Steel Corp., Ltd., has been nominated an honorary vice-president of the (British) Iron and Steel Institute, London, England. DR. JAMES WHITE, of Glasgow, has been awarded the Andrew Carnegie Gold Medal for 1938 for his paper on "Equilibrium at High Temperatures in Systems Containing Iron Oxides."

Defense of the Machine

A VERY practical piece of public relations work is being done by the Curtis Pneumatic Machinery Co., St. Louis, as an outcome of the suggestion made editorially in the "Threat to the Machine" in The Iron Age of May 18.

To quote Mr. L. C. Blake, advertising manager of that company:

"We are therefore proceeding immediately to have a label made up which will go on all outgoing crates, and boxes shipped out of our plant which label will read as follows:

The making of this product provides jobs. Its accurate, uniform, precision workmanship and favorable price is possible only through machine manufacture; otherwise these jobs would not exist.

CURTIS - ST. LOUIS

"We have no desire to limit this idea to our own special use and benefit and will be happy to have anyone use this wording or anything similar over their own name for the same purpose for the general good of industry."

If all of the believers in the machine would similarly interpret it to the public, the danger of hampering restrictions would pass. The public would soon realize what it owes to invention and improvement.

Cincinnati Milling Machine Co. Honors 100 "Old Timers"

EXACTLY ninety-nine men and one woman, whose combined years of employment totaled 2946, were dinner guests of the Cincinnati Milling Machine Co.'s president, Frederick V. Geier, on May 26, honoring those "Old Timers" who have been associated with the company for 25 years or more.

Meeting in the East Lodge of the firm's Recreation Fields, men who started to work before the turn of the century, and saw a young company struggle and grow into a leader in its field, through depression and prosperity, celebrated together their long association.

From Edward "Bud" Sand, 69 years old, and with the firm since its founding 55 years ago, down to the group of 47 employed from 25-30 years, the "Old Timers" filled the lodge to capacity.

Gold watches were presented Harry Meyer, with 43 years of service, Charles Eck, 43 years and to Adam Fath, 42 years. Mr. Sand, who was presented with a gold watch five years ago, accepted an engraved plaque signed by President Geier, with an account of his experiences with the company since the age of 14 when he was hired as an apprentice.

With Philip O. Geier, chairman of the board, acting as toastmaster, a host of old timers, including Miss Henrietta Gersman, sole woman in the group, and Frederick V. Geier, told briefly of their careers and experiences with the company.

Cleveland Industries Honor Veteran Employees

CLEVELAND — Veteran employees of local industries were honored May 29, at a banquet of the Cleveland Chamber of Commerce. John A. Stephens, director of industrial relations, United States Steel Corp. gave an address.

Steel Fabricators Honor Fred T. Llewellyn

DIRECTORS of the American Institute of Steel Construction presented Fred T. Llewellyn of the United States Steel Corp. an engrossed resolution of appreciation for his contribution to the structural steel fabricating industry. Mr. Llewellyn, research engineer, will retire shortly.

Sheet & Tube Pays Regular Preferred

YOUNGSTOWN SHEET & TUBE CO. at a meeting, May 23, declared the regular quarterly dividend of $1.37½ on preferred stock payable July 1.

Woodward Blast Furnace Being Air Conditioned

CONSTRUCTION of what is said to be the world's first air conditioned blast furnace is under way at the Woodward Iron Co., Woodward, Ala., in a move to determine if this method of producing better pig iron is successful from an economical and practical standpoint.

H. A. Berg, president of Woodward, said the object of the experiment is to control the amount of moisture in the air in an effort to obtain greater uniformity in pig iron. He has signed a contract with Carrier Corp., Syracuse, N. Y.

The installation calls for refrigeration and air conditioning equipment to control the amount of moisture in the air handled. Twenty-seven hundred tons of air per day are cooled to a constant predetermined dewpoint, then heated to a temperature of 1000 deg. F. with no water added. A daily average of twenty tons of water are removed from the air. The conditioned air is then blown at a pressure of from 5 to 30 lb. per sq. in. into the blast furnace.

"Some 30 years ago, Gayley introduced through refrigeration, dry air blast but the economics would not allow its continuance, although technically it was successful," Mr. Berg said. "However, now that modern air conditioning has proven that the control of moisture content is possible on an economical basis, Woodward has decided to adopt control of the uniformity of the air blast as well as that of ore and coke."

Institute Takes Over Technical Association

RESEARCH in steel technology formerly conducted by the Association of American Steel Manufacturers Technical Committees, with headquarters at Pittsburgh, is being transferred to the Technical Committees of American Iron and Steel Institute, effective June 1. The offices of the association, established some 40 years ago, are being closed. The standards for chemical compositions, physical properties, rolling tolerances and other permissible variations from specified dimensions originally promulgated by the association will hereafter be sponsored by the institute, and will be published as a part of its "Steel Products Manual."

Iron and Steel Exports (In Gross Tons)

	April		Four Months Ended April	
	1939	1938	1939	1938
Pig iron	1,599	44,362	13,507	157,210
Ferromanganese and spiegeleisen	7	5	34	114
Other ferroalloys	50	83	243	522
Scrap, iron and steel	237,691	306,900	996,052	1,253,050
Scrap, tin plate	1,398	2,640	5,691	6,496
Waste-waste tin plate	1,035	412	3,440	2,381
Pig iron, ferroalloys and scrap	*241,780*	*354,402*	*1,018,967*	*1,419,773*
Ingots, blooms, billets, sheet bars	4,620	7,757	33,835	97,283
Ingots, etc., alloy steel, incl. stainless	1,614	17	6,338	648
Skelp	824	2,752	2,917	5,506
Wire rods	1,791	2,829	5,158	11,477
Semi-finished steel	*8,849*	*13,355*	*48,248*	*114,914*
Bars, plain and reinforcing	10,986	12,074	46,008	55,613
Bars, alloy steel	752	295	4,241	1,506
Bars, stainless steel	51	16	183	171
Iron bars	72	89	245	637
Plates, plain and fabricated	23,955	23,088	84,440	82,016
Plates, alloy steel	83	564	261	1,355
Plates, stainless	5	91	22	114
Sheets, galvanized steel	8,759	3,371	28,720	20,326
Sheets, galvanized iron	834	465	1,983	1,290
Sheets, black, plain steel	21,568	14,130	93,527	70,503
Sheets, alloy steel	195	232	853	1,790
Sheets, stainless	92	57	261	570
Sheets, black iron	377	318	2,146	1,896
Hoops, bands, strips, plain steel	4,158	3,335	23,236	21,094
Hoops, bands, strip steel, alloy	56	15	127	93
Hoops, bands, strip steel, stainless	113	45	335	212
Tin plate and taggers tin	16,740	17,972	57,113	67,309
Terne plate (including long ternes)	556	249	1,167	1,978
Structural shapes, plain material	7,219	5,840	24,748	29,310
Structural material, fabricated	3,279	2,897	10,536	15,766
Sheet piling	727	171	1,580	1,379
Tanks, steel	2,081	2,075	6,778	12,238
Steel rails	6,785	7,123	18,988	36,203
Rail fastenings, switches, spikes, etc.	1,321	795	5,474	4,440
Boiler tubes	700	770	2,191	2,306
Casing and oil line pipe	6,968	7,899	22,416	34,822
Pipe, black and galv., welded steel	3,536	1,348	12,713	7,307
Pipe, black and galv., welded iron	333	230	2,141	1,594
Plain and galvanized wire	3,728	4,054	16,617	12,922
Barbed wire and woven wire products	4,030	2,682	12,972	6,667
Wire rope and other products	1,228	864	4,017	3,585
Nails and tacks	1,819	1,838	7,194	6,196
Bolts, nuts, rivets and washers except track	722	671	2,631	2,793
Other finished steel	650	251	2,086	1,705
Rolled and finished steel	*134,478*	*115,944*	*497,940*	*507,706*
Cast iron pipe and fittings	4,511	1,802	11,258	7,456
Malleable iron screwed fittings	323	257	1,150	972
Carwheels and axles	2,050	1,794	7,186	6,585
Castings, iron and steel	586	539	2,026	2,075
Castings, alloy steel, incl. stainless	54	74	448	225
Forgings, plain	1,165	1,048	2,846	3,140
Forgings, alloy steel, incl. stainless	212	34	641	170
Castings and forgings	*8,901*	*5,548*	*25,555*	*20,623*
Total	394,008	489,249	1,590,730	2,063,016

Iron and Steel Imports (In Gross Tons)

	April		Four Months Ended April	
	1939	1938	1939	1938
Pig iron	3,512	3,823	8,359	17,670
Sponge iron	152	1	603	313
Ferromanganese[1]	1,998	986	11,344	3,325
Spiegeleisen	1,778	3,204	6,963	3,835
Ferrochrome[2]	39	17	73	37
Ferrosilicon[3]	110	42	582	199
Other ferroalloys[4]	37	....	107	1
Scrap	2,769	12	8,295	461
Pig iron, ferroalloys and scrap	*10,395*	*8,085*	*36,326*	*25,841*
Steel ingots, blooms, etc.	....	4	3	4
Billets, whether solid or hollow	40	11	86	303
Wire rods	638	271	3,366	1,732
Semi-finished steel	*678*	*286*	*3,455*	*2,039*
Concrete reinforcement bars	596	38	1,306	369
Hollow steel bars	75	76	372	396
Merchant steel bars	1,795	1,462	6,954	5,859
Iron slabs	....	....	....	....
Iron bars	41	112	229	247
Boiler and other plate (including skelp)	1	48	3	103
Sheets, skelp and saw plate	325	2,191	816	4,675
Die blocks or blanks, etc.	1	20	15	34
Tin plate, taggers' tin and terneplate	....	....	19	20
Structural shapes	5,873	4,473	15,684	11,815
Sashes and frames	....	....	5	....
Sheet piling	462	....	462	....
Rails and track material	1,567	458	2,166	1,399
Welded pipe	1,652	98	2,953	1,267
Other pipe	14,467	259	23,482	9,480
Cotton ties	....	....	2	19
Other hoops and bands	1,549	1,579	6,980	5,743
Barbed wire	1,815	554	6,546	6,233
Round iron and steel wire	139	98	1,054	394
Telegraph and telephone wire	1	....	2	5
Flat wire and steel strips	264	191	996	1,038
Wire rope and strand	296	185	796	791
Other wire	213	86	859	538
Nails, tacks, and staples	1,419	561	3,547	2,360
Bolts, nuts, and rivets	7	17	43	51
Horse and mule shoes	29	39	162	117
Rolled and finished steel	*32,587*	*12,475*	*75,453*	*52,953*
Malleable iron pipe fittings	....	5	20	36
Cast iron pipe and fittings	72	16	275	508
Castings and forgings	*351*	*370*	*736*	*907*
Total	44,083	21,237	116,265	82,284

[1] Manganese content; [2] chrome content; [3] silicon content; [4] alloy content.

April Steel Exports Decline 8214 Tons

WASHINGTON—Dropping 8214 gross tons, exports of iron and steel in April totaled 153,884 tons, compared with 162,098 tons in March, according to the Metals and Minerals Division, Department of Commerce. Making a much sharper decline, scrap exports fell 72,138 tons to 240,124 tons from 312,262 tons. For the first four months of the current year outgoing shipments of new iron and steel declined to 585,547 tons from 801,089 tons in the corresponding period of 1938. Scrap exports decreased to 1,590,730 tons from 2,063,016 tons.

Plain black plates represented the largest finished steel movement in April. Totaling 23,252 tons, the chief consuming sources were Kwangtung, 8277 tons; The Netherlands, 5165 tons, and Sweden, 2334 tons. Ranking next were black sheets whose exports were 21,568 tons. The chief purchasing countries were Russia, 4795 tons; Canada, 2660 tons; Brazil, 2441 tons; Mexico, 2129 tons; France, 1667 tons, and the United Kingdom, 1544 tons. Tin plate exports totaled 16,740 tons. The principal countries of consumption were Brazil, 3478 tons; The Netherlands, 2312 tons; Canada, 1693 tons; the Union of South Africa, 1077 tons; Philippine Islands, 1069 tons, and China, 1050 tons.

April Imports of Iron and Manganese Ores

(In Gross Tons)

	Iron Ore		Manganese Concentrates, 35 Per Cent or Over	
	1939	1938	1939	1938
Canada	33	31	12	....
Cuba	21,500	....	3,063	....
Chile	120,100	143,400	....	....
Spain	....	....	....	....
Norway	20,444	....	....	....
Sweden	....	15,521	....	....
French Africa	....	....	....	....
Russia	....	....	580	3,720
India	....	....	....	444
Brazil	....	....	2,098	....
Gold Coast	....	....	3,833	3,002
Other countries	36	9,037	....	14
Total	162,113	167,989	9,586	7,180

United States Imports of Pig Iron by Countries of Origin

(In Gross Tons)

	April		Four Months Ended April	
	1939	1938	1939	1938
United Kingdom	....	....	....	....
British India	3,234	500	4,635	9,161
Germany	....	....	....	....
Netherlands	....	98	3,035	4,358
Canada	178	237	589	1,013
France	....	....	....	....
Belgium	....	....	....	....
Norway	....	2,988	....	3,138
Sweden	....	....	....	....
Russia	....	....	....	....
Other countries	100	....	100	....
Total	3,512	3,823	8,359	17,670

A United Steel Industry

THE steel industry the past week presented a united front in demanding that defects causing strikes and other industrial disorders during the past few years be stricken from the National Labor Relations Act.

For the first time since the passage of the controversial Wagner Act—considered by many an outstanding obstacle to business recovery—the American Iron & Steel Institute publicly recommended drastic revisions in that law.

Among these revisions, outlined by Walter S. Tower, executive secretary of the institute, before the Senate Committee on Education and Labor, was one restoring "free speech" to employers, permitting them to discuss labor organizations with their employees.

Presentation Came Suddenly

The steel industry's decision to present its case against the Wagner Act came suddenly. A few weeks ago it was expected that the attitude of steel manufacturers toward the act would not thus be presented for some months. Mr. Tower's 66-page statement on behalf of the institute, however, placed steel among the first of the large industries to present its case before the Senate committee.

Industrial observers noted that the institute's recommendations for the labor act alterations were approved unanimously by its board of directors which includes high officials of United States Steel Corp., Bethlehem Steel Co., Republic Steel Corp., National Steel Corp., Jones & Laughlin Steel Corp., Youngstown Sheet & Tube Co. and other companies, some of which have signed contracts with John L. Lewis' SWOC and others which have not signed such contracts.

Not Against Liberties

As spokesman for steel, Mr. Tower reminded the Senate committee that "the steel industry does not wish to take away any part of the liberties which Congress has undertaken by the National Labor Relations Act to guarantee to the employees of this country." He said that the steel industry believes the following changes in the Wagner Act are necessary:

1. To provide full protection to employees in the exercise of their collective bargaining rights against interference, restraint or coercion by anyone.

2. To safeguard the right of free speech by specifically permitting employers to express opinions and to confer and advise with employees.

3. To permit a direct appeal to the courts by both employees and employers from Labor Board decisions regarding the representation of employees.

4. To provide that, in any court proceeding to enforce or review a board decision, findings of fact by the board shall be conclusive only if supported by the weight of the evidence.

5. To limit the time within which the board may issue a complaint involving an alleged unfair labor practice.

6. To place the prosecuting and judicial functions under the act in separate and independent bodies.

7. To enlarge the body which shall adjudicate cases under the act sufficiently to insure full consideration by one or more of its members of all cases presented to it for decision.

Right to Work Unprotected

"The act expressly recognizes and protects the rights of employees to strike," Mr. Tower said. "It does not expressly recognize or protect the right of every American citizen to work. The act should do that, and in such clear manner as will require the effective enforcement of that right.

"If the act is to be so applied as to cut off the normal intercourse between employees and employers, it will surely promote unrest and even strife between them. To prohibit employers from expressing their opinions or giving advice to their employees with respect to matters having to do with labor relations tends to create a barrier between them and to promote industrial discord and strife to the detriment not only of employers and employees, but also of the general public.

Finds Act Fails

"In conformity with the declared purposes of the act employees should have full freedom to decide for themselves whether or not to join any labor organization. In its failure to afford to employees protection from interference, restraint or coercion by other employees or by organizations of employees, the act fails to accomplish its purposes."

Early in his statement to the committee, Mr. Tower said that the institute, which includes about 100 companies employing approximately 450,000 employees, has never concerned itself with relations between its members and their employees, considering those relations the sole concern of individual companies. It has concerned itself, he said, with the general aspects of labor relations of interest to all industry and to the country.

Not Opposed to Law

The impression that the steel industry is opposed to the Wagner Act is erroneous, he said, although industry believes that the act has not promoted industrial peace and harmony and that the administration of the act has not served to protect the rights of employees.

The institute official discussed in detail each of the seven changes which the steel industry believes should be made in the labor law.

One Fifth Are Members

"Some of those who oppose changes in the act apparently believe that all employees in industry generally, if freed from interference, restraint and coercion by their employers, would of their own free choice join national labor organizations. That belief is not supported by the facts. Only about one-fifth of the total number of workers in this country of the classes that national labor organizations consider eligible for membership are even nominally members of such organizations.

"It has frequently been asserted that it was the intent of Congress in passing the act, and that it is the policy of the Labor Board in administering the act, that employees should be forced

Defends "Right to Work"

to join national labor organizations. Whatever may be the policy of the board in that respect, we do not believe that in passing the act Congress had any such intent.

"Methods of dealing between the employer and his employees will vary according to the wishes of the employees when they shall be freed of all interference and restraint. Some of them will prefer to be represented by national unions, others by local independent organizations.

Widespread Coercion

"It is a matter of common knowledge that in connection with the various drives for union membership in the steel industry there has been widespread misrepresentation and coercion of employees by persons claiming to represent labor organizations, and there is reason to believe that a similar situation has been obtained in other great industries of the country. We are certain that an investigation by the committee would show that to be the fact.

"There cannot be any reasonable doubt that many employees have been forced to sign with labor organizations because of actual or threatened violence to themselves or their families by members or representatives of such labor organizations and that employees who have refused to join labor organizations have been prevented from working at their jobs when they desired to continue to work."

Local Authorities Helpless

Having undertaken to protect employees in the exercise of collective bargaining rights, Congress cannot properly stop short of granting full protection from coercion, a protection, Mr. Tower continued, which cannot be provided by local authorities acting under local laws.

He said he believed that the interests of the employee and the employer are not fundamentally antagonistic, and that both depend upon the prosperity of the business in which they engaged.

"It is certainly not a proper function of the Government to dictate to employees the kind of labor organization which they shall join," Mr. Tower told the committee.

Steel Takes A Stand Against Closed Shop

"JUST as every American citizen has a right, if he desires, to strike, so also he has, or clearly should have, a right, if he desires, to continue to work when work is available, without paying tribute to any organization for the privilege of so doing and without interference from employees who may choose to cease work."

The above lines from Walter S. Tower's statement this week to the Senate Committee on Education and Labor, were approved unanimously by the directors of the American Iron and Steel Institute, representing all large steel companies and many small manufacturers.

He noted that "if it be assumed that to grant employees full protection against coercion would overburden the Labor Board," then Congress should not pass any law which would overburden the courts as they now exist.

Rights of Americans

"Just as every American citizen has a right, if he desires, to work, so also he has, or clearly should have, a right, if he desires, to continue to work when work is available, without paying tribute to any organization for the privilege of so doing and without interference from employees who may choose to cease work."

We believe, the institute official said, that there should be inserted in the act appropriate provisions to make it clear that nothing therein shall be so construed as to interfere with or impede or diminish in any way the right to work.

Another change proposed by Mr. Tower would give workmen the right to choose a national organization, a local organization or whatever form of union they prefer. In many instances, he said, local unions have proved the most effective agencies for collective bargaining and have been a powerful factor in promoting good labor relations, improving the standards of the workers, preventing work stoppages and promoting efficiency and economy.

Anything in the Wagner Act "which may have the effect of compelling or permitting anyone to require an employee as a condition of employment to become a member of any labor organization (closed or union shop) is contrary to the fundamental principles of American government," the Senate committee was told.

Urging that employers be given the right to express their opinions to their employees, Mr. Tower said that "to require an employer to stand silently by and permit his employees to be influenced by falsehoods, threats and intimidation . . . must defeat the purposes of the act."

The steel institute, Mr. Tower told the Senate committee, "stands wholeheartedly behind the purposes of the Wagner Act, does not want to see the act emasculated or its efficiency impaired, but desires to see it amended in ways shown to be necessary by experience since its passage."

Detroit Buys Cast Iron Pipe from France

DETROIT—The Detroit Board of Water Commissioners has authorized the purchase of French-manufactured cast iron pipe. The board voted to split an award, giving two-thirds of 10,000 ft. of 6-in. and 20,000 ft. of 8-in. pipe to the Central Equipment Sales Corp. of New York, agent for Pont-A-Mousson of Nancy, France, and the rest to the Lynchburg Foundry Co., Lynchburg, Va. The French price on a delivered basis Detroit, was 30 per cent below the American price. Corporation Counsel Raymond J. Kelly ruled that the commission could not legally disregard the low bidder.

. . . OBITUARY . . .

T. MOREY RUDE, vice-president and general manager of Bundy Tubing Co., Detroit, was buried May 31. Born in New York 54 years ago, Mr. Rude had lived in Detroit more than 20 years. He died May 27 at his farm at Memphis, Mich. He was a member of the Society of Automotive Engineers.

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CHARLES C. DEUEL, since 1905 a manufacturer of sheet metal and welding materials, died May 30 at Detroit. Mr. Deuel, who was born in Detroit in 1856, had formerly been with the Michigan Central Railway, the D. M. Ferry Seed Co. and was a jobber of plumbing supplies previous to 1905. He was a member of the Detroit Board of Commerce. Arthur W. Deuel, a son, has been associated with him in business.

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HENRY S. BECKER, operator of the H. S. Becker Mfg. Co., Royal Oak, Mich., was shot fatally Saturday, May 27, in the yard of his home a short distance from his plant. Police believe that the slayers had planned to rob Becker, who had withdrawn money from the bank that day for a trip to Chicago. The Becker company is concerned principally with tin plating work for the Ford Motor Co.

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HARVEY S. LEE, general foreman of the Fisher Body Co. plant at Lansing, Mich., died May 31, aged 38 years.

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JOHN EMMETT Reilly, general superintendent of the Elgin, Joliet & Eastern Railroad, died recently in Joliet aged 65 years. Mr. Reilly had been employed by the railroad since 1892, when he started as a brakeman.

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VIRGIL H. HOAGLAND, a sales representative in Atlanta, Ga., for the Crucible Steel Co. of America, New York, died recently. He was 64 years old.

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RALPH L. NOLL, planning engineer at the Cleveland equipment works of the Incandescent Lamp Division, General Electric Co., and a former employee of American Rolling Mill Co., Middletown, Ohio, died May 23 in Cleveland at the age of 56.

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EVERETT WESLEY PIKE, superintendent of the Detroit Steel Casting Co., died in Detroit on May 24. Mr. Pike was born in Livermore Falls, Me., 70 years ago. He had been an employee of the Detroit Steel Casting Co. for 26 years.

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JAMES W. THORNTON, former Republic Steel Corp. executive and superintendent of the Lake Erie Steel Co., Cleveland, died May 26, aged 58 years. After leaving Lake Erie Steel he had worked for National Carbon Co. and Union Carbide & Carbon Co.

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THOMAS B. METZGER, Cleveland consulting engineer and former superintendent of the engineering department of Cambria Steel Co., and the Johnstown Water Co., a subsidiary of Bethlehem Steel Corp., died May 25 at his home in Lakewood, Ohio, at the age of 59.

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CHARLES B. D. WOOD, president of the Pressed Steel Co., Wilkes-Barre, Pa., died on May 27 at his home at Kingston, Pa., where he was born 55 years ago. He was graduated from Cornell University, and in 1909 started the business of which he was the head.

Put 16½% More Wires In Same Phone Cable

LONG recognized as pioneers in the development of lead-covered telephone cable, engineers of the Bell System have made another historic advance with the manufacture of cable containing 4242 separately insulated copper wires. Heretofore, the maximum contained in one cable was 3636 wires. The outside diameter of 2⅝ in. is maintained. Since the diameter of each wire in the new cable is also the same as before, the feat of placing 606 more within the same girth was made possible by an improved technique of wire insulation invented by the Western Electric Co., a method which reduced the thickness of the insulation surrounding each strand 0.003 in. This tiny saving, repeated 3636 times, resulted in a total saving of space sufficient to afford room for the additional wires.

The method of insulating the wires is in itself a revolutionary development of the last decade. Previous to the invention of this process, wires intended for cable had been insulated by wrapping paper ribbon spirally around them. Then it was discovered that paper pulp could be formed around the wire, and now machines literally manufacture a thin coating of paper on the wire, 60 strands at once, as they pass through a bath of pulp.

The cable core of 2121 pairs of conductors is built up from these individual strands by first twisting two wires into a pair, then binding 101 of these pairs into a unit. Finally, 21 of these units are twisted together, and the core, after being dried out in vacuum ovens, is sheathed with lead that is forced through dies under great pressure.

U. S. Scrap Consumption Gains, Exports Lag

DOMESTIC consumption of scrap iron and steel continues in excess of last year by a wide margin, while exports still are running behind, according to the Institute of Scrap Iron and Steel, Inc., New York. In the first four months of this year consumption has totaled 9,474,117 gross tons. This is an increase of 71.2 per cent over the 5,538,212 tons melted in the comparable period of 1938. Exports at 1,005,183 tons in the first four months of 1939 were 20.3 per cent less than the 1,261,927 tons shipped abroad in the corresponding period of 1938, the institute says.

Timken-Detroit Axle Acquires Delta Mfg. Co.

TIMKEN-DETROIT AXLE CO. has purchased Delta Mfg. Co., effective June 1. It also was announced that Herbert Tautz, president of the Delta plant at Milwaukee, is retiring from active management. The sale, said to involve about $1,000,000, was made through an exchange of stock.

April Steel Output Off 12%; Payrolls Down 9%

REFLECTING a 12 per cent drop in steel ingot production in April, employment and payrolls in that month likewise declined, reports the American Iron and Steel Institute. A comparison:

	April '39	*March '39*	*April '38*
Employees ..	452,000	455,000	445,000
Payrolls ...	$58,517,000	$64,174,000	$47,809,000
Wages per hr.	82.9c.	82.8c.	82.6c.
Hr. per week	32.1	34.7	25.6

Britain Needs Scrap as Its Production of Steel Expands

LONDON—While British steel authorities agreed that there is bound to be a further increase in production in May, they are rather skeptical about the high estimate—14,500,00 tons—of the industry's present annual capacity. This estimate is based on the report of the Import Duties Advisory Committee in 1937, which placed the effective capacity of the trade, at July, 1936, at 12,600,000 tons. The committee suggested that a production rate of 13,500,000 tons per annum would be reached by the end of 1937.

The total open hearth and bessemer capacity of the trade at that date was eventually figured at 13,800,000 tons, and since then it has been raised by further plant extensions to the present estimate of 14,500,000 tons. In reaching this total, allowance is made for normal shutdowns for overhaul and maintenance but not for any abnormal breakdowns or defects, so that the figure represents the aggregate tonnage which it is theoretically possible to produce.

In practice, however, it has been found that the theoretical margins are insufficient, and that the industry could not be operated at much more than 90 per cent of capacity for any length of time. This would put the practical limit at a little over 13,000,000 tons a year. The increase in capacity established since the end of 1937 is stated to be slightly over a net 200,000 tons. Bearing in mind that the tonnage until the end of April was well below the corresponding figure for 1937 and 1938, the achievement of a new production record this year would constitute a very remarkable performance.

Temporarily, raw materials present a problem hindering the establishment of a new record. It is being asked whether it was wise to allow such large exports of scrap during the period of relative inactivity and whether it would not be advantageous to place a restriction on future exports in the event of another such period recurring.

At present, however, there appears to be no prospect of serious difficulty in satisfying the commercial demand for steel, which is still responsible for the bulk of the output. The demand for steel for defense purposes is very limited so far as tonnage is concerned, and any delays it causes in commercial deliveries are the result of priority given to Government emergency orders rather than of any straining of mills' capacity.

It is largely as a result of the revival of shipbuilding activity that scrap is again being imported from the United States on a large scale. Within the past six weeks 17 vessels have been chartered to carry over 110,000 tons of scrap from America to Britain.

Prior to the purchase of these cargoes there had been no British buying of scrap from America for a considerable time. The British market, indeed, had been overstocked since the purchase of between 20 and 30 old ships from the U. S. Maritime Commission in the fall of 1937. These vessels were mostly loaded with scrap before sailing, which added to the accumulation of scrap at a time when demand was failing.

British scrap imports from the United States totaled 1,087,576 tons in 1936 and nearly 1,000,000 tons in 1937, but declined to the low level of 32,169 tons in the first four months of the current year, compared with 487,232 tons in the corresponding period of 1938.

It is expected that the volume of scrap imports into Britain during the second half of 1939 will equal or possibly exceed those of the corresponding months of last year.

Gov. James Backs Labor Law Changes

HARRISBURG, PA.—The revisions to the Pennsylvania state labor relations act which were approved over a week ago by the House and Senate, are expected to be signed by Gov. James, despite vehement protests by the AFL and CIO.

Provisions which apply to intrastate employees and employers and which are amendments to the state labor law, include those outlawing sitdown strikes, complaints filed by employers as well as employees to be investigated, check-off of union dues prohibited except by a majority vote on a secret ballot of employees, and describing as an unfair labor practice coercion of any employee or employer by an employee or group of employees.

After a conference with labor leaders, Governor James declared, "These amendments were passed as a means of helping Pennsylvania dig herself out of the disastrous mess in which she was left by four years of extravagance, experimentation and stupidity of the little New Deal."

REINFORCING STEEL

AWARDS

ATLANTIC STATES

1275 Tons, Buffalo, "Commodore Perry" housing project, to Truscon Steel Co., Buffalo.

1600 Tons, New York, East Side Drive, 54th to 64th Street, to Truscon Steel Co., Youngstown, through Poirier & McLane Corp., New York.

950 Tons, Brooklyn, Mill Basin bridge, MS-39-3B, to Bethlehem Steel Co., Bethlehem, Pa.

600 Tons, State of Pennsylvania, Laurel Hill tunnel, Pennsylvania Turnpike Commission, to Truscon Steel Co., Youngstown, through Hunkin-Conkey Construction Co., contractor.

600 Tons, Wyndmoor, Pa., Eastern Regional Agricultural Research laboratory, to Sweets Steel Co., Williamsport, Pa., through Sordoni Construction Co., contractor.

600 Tons, Washington, outfall sewer, Bolling Field, to Bethlehem Steel Co., Bethlehem, Pa., through Diamond Construction Co., contractor.

260 Tons, Peabody-Danvers, Mass., State road and bridge, to Truscon Steel Co., Youngstown.

250 Tons, Buffalo, Kleinhaus Music Hall, to Bethlehem Steel Co., Bethlehem, Pa.

200 Tons, Washington, Lansburg Brothers warehouse, to Jones & Laughlin Steel Corp., Pittsburgh, through Rosslyn Steel & Cement Co.

150 Tons, East Greenbush, N. Y., Junior-Senior High School, to Strope Steel Co., Albany, N. Y.

150 Tons, Delaware County, Pa., road project, to Bethlehem Steel Co., Bethlehem, Pa., through Hempt Brothers, Harrisburg, Pa.

140 Tons, Wyoming County, Pa., road project, to Bethlehem Steel Co., Bethlehem, Pa., through Banks Construction Co., Wilkes-Barre, Pa.

CENTRAL AND WESTERN STATES

500 Tons, Chicago, Burr Oak Avenue, viaduct, to Joseph T. Ryerson & Son, Inc., through Thomas McQueen Co., Chicago.

450 Tons, Peoria, Ill., laboratory for Department of Agriculture; O'Neil Construction Co., low bidder on general contract.

200 Tons, Urbana, Ill., Students' Union building, University of Illinois, to Laclede Steel Co., St. Louis, through English Brothers, Champaign, Ill., general contractors.

198 Tons, Urbana, Ill., Department of Natural Resources Building, University of Illinois, to Joseph T. Ryerson & Son, Inc., through James McHugh Sons, Inc., Chicago.

PENDING REINFORCING BAR PROJECTS

ATLANTIC STATES

1200 Tons, Binghamton, N. Y., United States Engineers, channel improvement, Canisteo River at Hornell, N. Y.

1000 Tons, Lancaster, Pa., building for Armstrong Cork Co.

850 Tons, Bethlehem, Pa., water works project; C. W. Good, Reading, Pa., contractor.

350 Tons, Weston, Mass., metropolitan district reservoir.

240 Tons, Bedford County, Pa., Section 11-B, Pennsylvania Turnpike Commission.

203 Tons, Kearny and Newark, N. J., approach piers, route No. 25, section 30B.

100 Tons, Cortland, N. Y., sewage disposal.

100 Tons, Fulton County, Pa., section 16B, Pennsylvania Turnpike Commission.

CENTRAL AND WESTERN STATES

3750 Tons, Chicago, section S3, Chicago subway; bids June 29.

1050 Tons, Cleveland, Woodhill Housing project; Hunkin-Conkey Construction Co., Cleveland, low bidder.

970 Tons, Pollock, Calif., Central Valley project (Invitation 33208-A-1); Columbia Steel Co., San Francisco, low bidder.

500 Tons, Louisville, Ky., underpass.

460 Tons, Buena, Wash., Yakima project (Invitation 33868-A-1); Bethlehem Steel Co., San Francisco, low bidder.

367 Tons, Pasadena, Calif., Arroyo Seco Parkway bridges between Avenues 50 and 58; bids June 15.

231 Tons, Ventura, Calif., junior college auditorium.

205 Tons, Boulder City, Nev., Boulder Canyon project (Invitation D-23038-A); Columbia Steel Co., San Francisco, low bidder.

200 Tons, Decatur, Ill., soy bean elevator, A. E. Staley Mfg. Co.; bids in.

130 Tons, Gallatin Valley, Mont., Middle Creek Dam; R. P. England, Sheridan, Wyo., contractor.

FABRICATED STEEL

. . . Lettings decline to 21,900 tons from 35,225 tons last week . . . New projects in small volume at 7800 tons . . . Plate awards total 2990 tons.

NORTH ATLANTIC STATES

AWARDS

4300 Tons, Buffalo, civic auditorium, to Bethlehem Steel Co., Bethlehem, Pa.

1115 Tons, Brooklyn, addition to Erasmus Hall High School, to Lehigh Structural Steel Co., Allentown, Pa.

900 Tons, New York, construction No. 7, East River Drive viaduct, to American Bridge Co., Pittsburgh.

695 Tons, Philadelphia, commissary building, Horn & Hardart Co., to Belmont Iron Works, Philadelphia.

550 Tons, Atlantic City, N. J., apartment building for Chelsea Housing Corp., to Jeystone Structural Steel Co., Philadelphia.

480 Tons, Buffalo, "Commodore Perry" housing project, to Bethlehem Steel Co., Buffalo.

290 Tons, Philadelphia, trusses and lintels, Glenwood housing project, Philadelphia, to Robinson Iron & Steel Co., Philadelphia.

250 Tons, Brooklyn, Shore Parkway grade separation, to American Bridge Co., Pittsburgh.

225 Tons, Bristol, Pa., building for Rohn & Hass, to Bethlehem Steel Co., Bethlehem, Pa., through Frank V. Warren, Inc., Bristol, Pa., general contractor.

185 Tons, Philadelphia, E. I. du Pont de Nemours & Co., reinforcing floors in building, to Belmont Iron Work, Philadelphia.

180 Tons, Newark, N. J., Our Lady of Good Counsel Church, to Bethlehem Steel Co., Bethlehem, Pa.

175 Tons, Northumberland, N. H., bridge, to American Bridge Co., Pittsburgh.

170 Tons, Wilmington, Vt., bridge, to Bethlehem Steel Co., Bethlehem, Pa., Rome Construction Co., Holden, Mass., contractor.

170 Tons, Harrisburg, Pa., building for International Harvester Co., to Bethlehem Steel Co., Bethlehem, Pa.

155 Tons, Rockville and Enola yards, Pennsylvania Railroad, to American Bridge Co., Pittsburgh.

140 Tons, Groton, Conn., Electric Boat Co. shop, to Bethlehem Fabricators, Inc., Bethlehem, Pa.

125 Tons, Wyoming County, Pa., bridge, to American Bridge Co., Pittsburgh.

100 Tons, Cummington, Mass., Plainfield Road bridge, to Phoenix Bridge Co., Phoenixville, Pa.

100 Tons, New London, Conn., shop to Bethlehem Fabricators, Inc., Bethlehem, Pa.

THE SOUTH

310 Tons, Winston-Salem, N. C., Hanes Hosiery, to Carolina Steel & Iron Co., Greensboro, N. C.

300 Tons, Kaufman County, Tex., bridge, to Mosher Steel Co., Dallas, Tex.

270 Tons, Williamson County, Tex., bridge, to Mosher Steel Co., Dallas, Tex.

CENTRAL STATES

2680 Tons, Lorain, Ohio, Erie Avenue bridge, to Mount Vernon Bridge Co., Mount Vernon, Ohio.

2400 Tons, Chicago, Burr Oak Avenue viaduct, to Bethlehem Steel Co., Bethlehem, Pa.

900 Tons, Dearborn, Mich., Driveaway building for Ford Motor Co., to Whitehead & Kales Co., Detroit.

440 Tons, Akron, Ohio, State bridge, to Burger Iron Co., Akron, Ohio.

300 Tons, Columbus, Ohio, alterations, main building, Battelle Institute, to American Bridge Co., Pittsburgh.

275 Tons, Manitowoc, Wis., building for Eddy Paper Co., to an unnamed fabricator

240 Tons, Rantoul, Ill., central heating plant for Government to an unnamed fabricator.

235 Tons, Chicago, second section of subway, to American Bridge Co., Pittsburgh.

220 Tons, Barberton, Ohio, gymnasium and grade school, to Burger Iron Co., Akron, Ohio.

180 Tons, Norwood, Ohio, Alterations and additions to assembly building, Chevrolet Motor Co., to Taylor & Gaskin, Inc.

150 Tons, Erie, Pa., addition to mixing building for Continental Rubber Works, to Rogers Structural Steel Co., Corry, Pa.

125 Tons, Detroit, plant for Gelatin Products Co., to R. C. Mahon Co., Detroit.

115 Tons, Lima, Ohio, railroad bridge over Ottawa River, to American Bridge Co., Pittsburgh.

115 Tons, Agnew, Ill., Whiteside County bridge, to American Bridge Co., Pittsburgh.

WESTERN STATES

1985 Tons, Redding, Cal., Shasta Dam towers, to American Bridge Co., Pittsburgh.

1650 Tons, Pollock, Cal., Sacramento River second crossing, to Bethlehem Steel Co., San Francisco; previously reported to American Bridge Co.

850 Tons, Pollock, Cal., Doney Creek bridge, to Bethlehem Steel Co., San Francisco; previously reported to American Bridge Co.

230 Tons, Denver, State highway bridge, to Kansas City Structural Steel Co., Kansas City, Kan.

100 Tons, Antler Cal., underpass for Central Valley project, to Bethlehem Steel Co., San Francisco.

PENDING STRUCTURAL PROJECTS

NORTH ATLANTIC STATES

900 Tons, New York, public school No. 31.

600 Tons, Hagerstown, Md., Elizabeth Street grade separation.

350 Tons, Somerset County, Pa., bridges; bids due June 9, Pennsylvania Turnpike Commission.

330 Tons, Freedonia, N. Y., State music building.

215 Tons, Fleetwood, N. Y., viaduct.

200 Tons, Buffalo, Hopkins Street grade crossing elimination; bids close June 19.

175 Tons, Philadelphia, storage and shipping building, for E. I. du Pont de Nemours & Co.

170 Tons, Poughkeepsie, N. Y., Vassar College infirmary building.

160 Tons, Monmouth County, N. J., highway project, route 4, section 40; bids due June 9.

125 Tons, New London, Conn., store building for Montgomery Ward & Co.

120 Tons, Brooklyn, showroom and commercial building for Brooklyn Edison Co.

115 Tons, Brooklyn, factory building for Bushwick Iron & Steel Co.

105 Tons, Elmira, N. Y., warehouse for Thatcher Mfg. Co.

THE SOUTH

150 Tons, Greensboro, N. C., pipe line support for Proximity Mfg. Co.

125 Tons, Kanawha County, W. Va., State bridge No. 1535.

120 Tons, Wheeling, W. Va., railroad bridge.

CENTRAL STATES

1900 Tons, Chicago, section S3, subway; bids June 29.

400 Tons, Hamilton County, Ohio, State bridge; bids June 20.

350 Tons, signal bridges, various locations, for Rock Island.

256 Tons, Adams County, Ohio, State bridge; Midland Construction Co., low bidder (previously reported).

220 Tons, Chicago, track elevation repairs, for Milwaukee Road.

200 Tons, Decatur, Ill., A. E. Staley Mfg. Co., plant addition; bids June 18.

175 Tons, Decatur, Ill., Spencer Kellogg & Sons, Inc., factory building; bids in.

110 Tons, Columbus, Ohio, bowling alley for B. & J. Realty Co.

WESTERN STATES

1479 Tons, Woodland, Wash., Lewis River bridge; bid call cancelled.

350 Tons, Warland, Mont., bridge for U. S. Forest Service.

125 Tons, Yegan, Mont., bridge over Canyon Creek for Northern Pacific Railway.

Unstated tonnage, Grand Coulee Dam, two 350-ton traveling cranes; bids July 10.

FABRICATED PLATES

AWARDS

2790 Tons, Bayonne, N. J., 10 tanks for Asiatic Petroleum Corp., to Hammond Iron Works, Warren, Pa.

200 Tons, Warren, Ohio, standpipe for city, to Warren City Tank & Boiler Works, Warren.

PENDING PROJECTS

Unstated tonnage, Grand Coulee Dam, 11 drum gates for spillway; bids July 12.

Unstated tonnage, Grand Coulee Dam, two 72-in. ring-seal gates for penstocks at power plant; bids July 3.

SHEET PILING

AWARDS

175 Tons, Buffalo, "Commodore Perry" housing project, to Bethlehem Steel Co., Buffalo.

PENDING PROJECTS

1756 Tons, Los Angeles, H-type bearing piles for United States Engineer; Columbia Steel Co., San Francisco, low bidder (previously reported).

540 Tons, Chicago, section S3, subway; bids June 29.

300 Tons, Cleveland, Cuyahoga River bulkhead, contract No. 16, cut 3-B; L. A. Wells Construction Co., Cleveland, low bidder.

Distributers Condemn Reciprocal Buying

A RESOLUTION expressing disapproval of reciprocal purchasing relations between manufacturer and distributer, unless the manufacturer has a manufacturing plant located in the natural area of the distributer was passed by the Southern Supply & Machinery Distributers' Association, at the Triple Convention held last week on board the S.S. Monarch of Bermuda. Those participating in the convention were the Southern Supply & Machinery Distributers' Association, the National Supply & Machinery Distributers' Association and the Amercian Supply & Machinery Manufacturers' Association. In addition to several joint sessions at which papers dealing with various phases of distributing were presented, each association also held individual business meetings.

New officers of the National association, elected at the convention, are: president, Charles E. Curtis, Western Iron Stores Co., Milwaukee; first vice-president, A. R. Smith, Boyer-Campbell Co., Detroit, and second vice-president, H. V. Waterman, Hendrie & Bolthoff Mfg. & Supply Co., Denver. The new officers of the Southern Supply Association are president, Edward F. Strauss, Oliver H. Van Horn Co., Inc., New Orleans; first vice-president, J. M. Bates, Moore-Hadley Hardware Co., Birmingham, and second vice-president, J. B. Crimmins, Mills & Lupton Supply Co., Chattanooga, Tenn. Officers elected by the American Supply Association were not available at the time of going to press.

Current Metal Working Activity

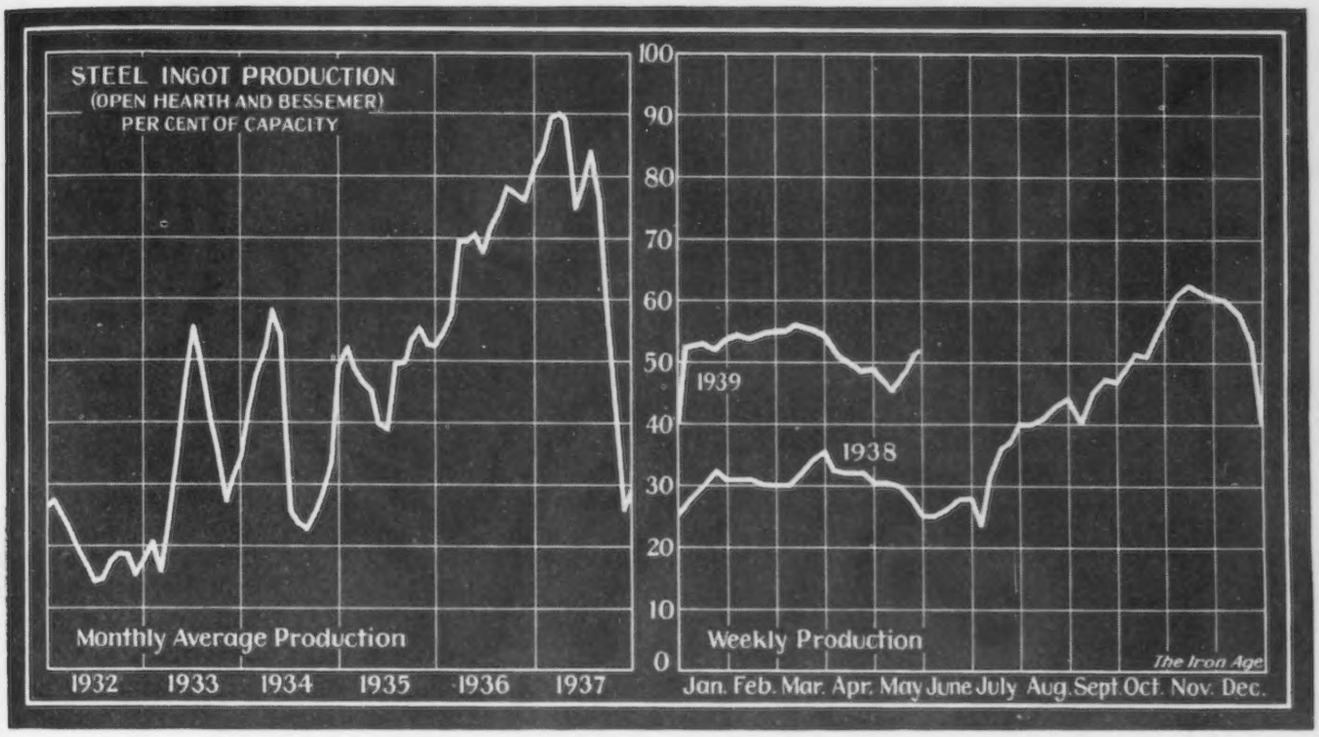
Latest Data Assembled by THE IRON AGE from Recognized Sources

	May 1939	April 1939	March 1939	April 1938	Four Months 1939	Four Months 1938
Steel Ingots: (gross tons)						
Monthly output[a]	2,917,876	2,986,985	3,396,021	1,925,166	12,491,670	7,354,863
Average weekly output[a]	658,663	696,267	766,596	448,757	728,377	428,855
Per cent of capacity[a]	48.24	50.99	56.14	33.44	53.35	31.29
Pig Iron: (gross tons)						
Monthly output[b]	1,717,516	2,056,177	2,394,615	1,376,141	8,686,402	5,555,981
Raw Materials:						
Coke output[c] (net tons)		2,934,560	3,507,237	2,510,964	13,034,807	10,761,095
Lake Ore consumed[d] (gross tons)		2,799,769	3,316,691	1,853,658	11,895,706	7,533,481
Castings: (net tons)						
Malleable, orders[e]		29,183	35,997	19,724	136,519	76,913
Steel, orders[e]		.....	41,367	21,869	.....	110,015
Finished Steel: (net tons)						
Trackwork shipments[a]		6,819	6,481	4,150	20,459	15,121
Fabricated shape orders[f]		116,801	95,065	91,158	396,297	312,879
Fabricated plate orders[e]		35,844	29,784	21,958	109,042	101,259
U. S. Steel Corp. shipments[g]		701,459	767,910	501,972	2,936,668	2,067,216
Fabricated Products:						
Automobile production[h]		359,200*	371,940	238,129	1,382,927*	906,475
Steel furniture shipments[e]		1,705,642	$1,886‡	$1,444‡	7,179,945	$6,933‡
Steel boiler orders[e] (sq. ft.)		764,996	616,682	474,931	3,329,637	2,150,838
Locomotives ordered[i]		19	63	3	93	39
Freight cars ordered[i]		2,695	1,000	3	5,702	819
Machine tool index[j]		155.6	185.4	90.3	91.0†	169.4†
Foundry equipment index[k]		146.0	146.6	79.3	142.8†	94.9†
Non-Ferrous Metals: (net tons, U. S. only)						
Lead shipments[l]		37,903	40,871	25,952	153,384	122,062
Lead stocks[l]		123,394	122,035	156,715	.....	.....
Zinc shipments[m]		40,641	45,291	20,806	168,399	101,362
Zinc stocks[m]		130,380	127,985	135,238	.....	.....
Tin deliveries[n] (gross tons)	5,905	5,980	4,755	5,980	19,170	18,270
Refined copper deliveries[o]		46,667	55,025	42,871	216,454	150,434
Refined copper stocks[o]		332,513	320,812	355,663	.....	.....
Exports: (gross tons)						
Total iron and steel[p]		394,008	474,360	489,249	1,590,730	2,063,016
All rolled and finished steel[p]		134,478	145,164	115,944	134,478	507,706
Semi-finished steel[p]		8,849	9,485	13,355	8,849	114,914
Scrap[p]		237,691	310,223	306,900	996,052	1,253,050
Imports: (gross tons)						
Total iron and steel[p]		44,083	25,369	21,237	116,265	82,284
Pig iron[p]		3,512	3,658	3,823	8,359	17,670
All rolled and finished steel[p]		32,587	14,102	12,475	75,453	52,953
British Production: (gross tons)						
Pig iron[q]		608,900	603,600	661,000	2,229,000	2,830,000
Steel Ingots[q]		1,058,200	1,170,900	938,000	4,011,900	4,192,800

† Three months' average. ‡ 000 omitted. * Preliminary.

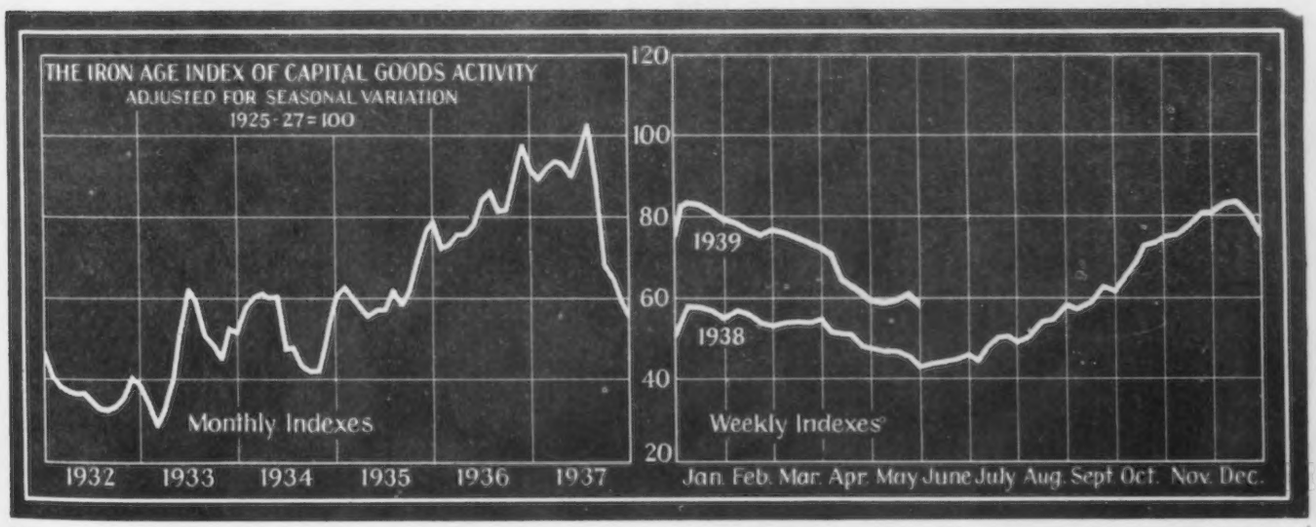
Source of data: [a] American Iron and Steel Institute; [b] THE IRON AGE; [c] Bureau of Mines; [d] Lake Superior Iron Ore Association; [e] Bureau of the Census; [f] American Institute of Steel Construction; [g] United States Steel Corp.; [h] Preliminary figures from Ward's Automotive Reports—Final figures from Bureau of the Census, U. S. and Canada; [i] *Railway Age*; [j] National Machine Tool Builders Association; [k] Foundry Equipment Manufacturers Association; [l] American Bureau of Metal Statistics; [m] American Zinc Institute; [n] New York Commodity Exchange; [o] Copper Institute; [p] Department of Commerce; [q] British Iron and Steel Federation.

Ingot Production Rises One Point to 53%



District Ingot Production, Per Cent of Capacity	Pittsburgh	Chicago	Valleys	Philadelphia	Cleveland	Buffalo	Wheeling	Detroit	Southern	S. Ohio River	Western	St. Louis	Eastern	Aggregate
CURRENT WEEK..	41.0	52.5	51.0	35.0	51.0	44.5	71.0	55.0	50.5	58.0	57.0	49.0	50.0	**53.0**
PREVIOUS WEEK..	41.0	53.5	49.0	33.0	51.0	46.5	65.0	55.0	50.5	53.0	60.0	41.0	50.0	**52.0**

Auto Strike Drives Capital Goods Index Down



THE drastic reduction in automobile assemblies in the past week was reflected in THE IRON AGE index of capital goods activity by a drop of 3.0 points in the combined index to 57.9, completely wiping out the gains of the two previous weeks. The automobile series itself declined to 33.8 from 58.0 in the preceding week, a 41.7 per cent drop. This represents the lowest index position of this series since the week of Aug. 27, 1938, and the smallest physical output since the week of Oct. 1, 1938. Were it not for the abnormal influence of the UAW strike, the combined index would have risen to about 62.5 in the past week, the highest level since mid-April. Both the Pittsburgh and the steel series continued to advance, but the volume of heavy engineering contracts placed in the short week was considerably lower. Lumber carloadings were off fractionally.

	Week Ended June 3	Week Ended May 27	Comparable Week 1938	Comparable Week 1929
Steel ingot production[1]	69.8	63.2	32.1	131.1
Automobile production[2]	33.8	58.0	28.6	109.9
Construction contracts[3]	70.2	74.7	61.1	125.2
Forest products carloadings[4]	52.7	53.2	47.7	111.2
Production and shipments, Pittsburgh District[5]	63.0	55.3	45.3	124.4
Combined index	**57.9**	**60.9**	**43.0**	**120.4**

Sources: 1. THE IRON AGE; 2. Ward's Automotive Reports; 3. *Engineering News-Record*; 4. Association of American Railroads; 5. University of Pittsburgh.

. . . SUMMARY OF THE WEEK . . .

. . . Steel output gains point to 53 per cent, highest rate since early April.

° ° °

. . . Producers unite to seek drastic Wagner Act amendments.

° ° °

. . . Scrap composite advances 37c. to $14.58 as market strengthens.

STEEL ingot production has gained another point to 53 per cent, the highest level since the first week of April, while scrap prices again have strengthened, THE IRON AGE composite price gaining 37c to $14.58.

Operating increases of two points to 51 per cent at Youngstown, two points to 35 per cent at Philadelphia, six points to 71 per cent at Wheeling, and five points to 58 in southern Ohio River plants offset narrow declines at Chicago, Buffalo and in the West, while the important Pittsburgh district operating rate remained unchanged.

Stronger mill schedules reflect moderate success by producers in driving in specifications on flat rolled steel booked during May "bargain days." Except for hot rolled bars, the price situation this week is more settled and a better feeling is replacing disordered conditions of a few weeks ago. Clarification of the bar prices, where large buyers face an increase of $1 a ton on third quarter business, is expected soon.

PERHAPS the most important industrial news of the week is a request by the American Iron & Steel Institute, representing steel manufacturers which have signed labor contracts with John L. Lewis' SWOC and others which have not, for drastic revisions of the Wagner Act. In a unanimous appeal for labor act changes the steel producers seek to restore free speech to employers, prevent a monopoly by national labor organizations and block attempts to link the right to work with compulsory payment of union dues.

Meanwhile, spreading strikes in plants of the automobile industry—a leading outlet for steel—supported the institute's position that the Wagner Act must be amended. Virtually the entire automobile industry the past week was on a weekly schedule of three days or less, due largely to strikes, which have already affected an estimated 100,000 men. Automobile assemblies have reached a new low point for 1939.

While new business in the domestic market is unimpressive (unlike that in England where pig iron output has been lifted to a new two-year peak and some steel products require as much as four months for delivery), railroad demand for steel shows signs of reviving and the Government shipbuilding program is gaining momentum.

The largest freight car inquiry to develop in some time is one for 1100 cars by the Western Maryland, involving 13,000 tons of steel. At Washington the Navy Department has awarded contracts for 12 vessels, valued at $107,131,000, to five companies, and has also assigned construction of 12 additional ships, including two 45,000-ton battleships, to seven yards. The 24 ships are expected to require nearly 100,000 tons of steel, including 34,000 tons of armor plate. Bids are sought by the Maritime Commission on an undisclosed number of cargo vessels requiring about 2650 tons of steel each.

STRUCTURAL steel lettings have declined to 21,900 tons from 35,225 tons the previous week, the largest of the new awards including 4300 tons for a civic auditorium at Buffalo, 2680 tons for a bridge at Lorain, Ohio, 2400 tons for the Burr Oak Avenue viaduct, Chicago, 1985 tons for Shasta dam towers at Redding, Cal., and 1115 tons for an addition to Erasmus Hall night school, Brooklyn. New structural projects are in small volume at 7800 tons, the largest being for 1900 tons for a section of the Chicago subway.

The week's reinforcing steel awards stand at 7800 tons, including 1600 tons for a section of the East River Drive in New York, and 1275 tons for a housing project at Buffalo. New reinforcing projects call for 10,500 tons.

Production of coke pig iron in May totaled 1,717,516 gross tons, compared with 2,056,177 tons in April. On a daily basis output last month dropped 19.2 per cent from April, or from 68,539 to 55,404 tons. There were 107 furnaces in blast on June 1, operating at the rate of 60,515 tons a day, compared with 102 on May 1, producing at the rate of 60,160 tons daily.

Output of open-hearth and Bessemer steel ingots in May totaled 2,917,867 tons, against 2,986,985 tons in April, and 1,800,877 tons in May, 1938.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	June 6, 1939	May 29, 1939	May 9, 1939	June 7, *1938
Rails, heavy, at mill	$40.00	$40.00	$40.00	$42.50
Light rails: Pittsburgh, Chicago, Birmingham	40.00	40.00	40.00	43.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Sheet bars: Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point	34.00	34.00	34.00	37.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham	40.00	40.00	40.00	43.00
Wire rods: Nos. 4 and 5, Pittsburgh, Chicago, Cleveland	43.00	43.00	43.00	47.00
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows Point, cents per lb.	1.90	1.90	1.90	2.10

Finished Steel

Cents Per Lb.:	June 6, 1939	May 29, 1939	May 9, 1939	June 7, *1938
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.15	2.15	2.25	2.45
Plates: Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont	2.10	2.10	2.10	2.25
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham	2.10	2.10	2.10	2.25
Cold finished bars: Pittsburgh, Buffalo, Cleveland, Chicago, Gary	2.65	2.65	2.70	2.90
Alloy bars: Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton	2.70	2.70	2.80	3.00
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham	2.00	2.00	2.15	2.30
Cold rolled strip: Pittsburgh, Cleveland, Youngstown	2.80	2.80	2.95	3.10
Sheets, galv., No. 24: Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham	3.50	3.50	3.50	3.80
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown	2.00	2.00	2.15	2.30
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown	3.05	3.05	3.20	3.35
Wire nails: Pittsburgh, Chicago, Cleveland, Birmingham	2.45	2.45	2.45	2.75
Plain wire: Pittsburgh, Chicago, Cleveland, Birmingham	2.60	2.60	2.60	2.90
Barbed wire, galv.: Pittsburgh, Chicago, Cleveland, Birmingham	†3.30	3.30	3.30	3.40
Tin plate, 100 lb. base box: Pittsburgh and Gary	$5.00	$5.00	$5.00	‡$5.35

*Pittsburgh prices only.
†Applies to 80-rod spools only.
‡Subject to post-season adjustment.

Pig Iron

Per Gross Ton:	June 6, 1939	May 29, 1939	May 9, 1939	June 7, *1938
No. 2 fdy., Philadelphia	$22.84	$22.84	$22.84	$25.84
No. 2, Valley furnace	21.00	21.00	21.00	24.00
No. 2, Southern Cin'ti	21.06	21.06	21.06	23.89
No. 2, Birmingham	17.38	17.38	17.38	20.38
No. 2, foundry, Chicago†	21.00	21.00	21.00	24.00
Basic, del'd eastern Pa.	22.34	22.34	22.34	25.34
Basic, Valley furnace	20.50	20.50	20.50	23.50
Malleable, Chicago†	21.00	21.00	21.00	24.00
Malleable, Valley	21.00	21.00	21.00	24.00
L. S. charcoal, Chicago	28.34	28.34	28.34	30.34
Ferromanganese, seab'd carlots	80.00	80.00	80.00	102.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:	June 6, 1939	May 29, 1939	May 9, 1939	June 7, *1938
Heavy melting steel, P'gh.	$14.75	$14.375	$14.75	$10.75
Heavy melting steel, Phila.	15.25	15.25	15.25	12.00
Heavy melting steel, Ch'go.	13.75	13.00	12.75	10.25
Carwheels, Chicago	12.75	12.75	12.50	12.00
Carwheels, Philadelphia	16.00	16.00	16.00	14.75
No. 1 cast, Pittsburgh	15.25	15.25	15.25	13.25
No. 1 cast, Philadelphia	16.25	16.25	16.25	14.25
No. 1 cast, Ch'go (net ton)	12.25	11.75	11.75	10.25

Coke, Connellsville

Per Net Ton at Oven:	June 6, 1939	May 29, 1939	May 9, 1939	June 7, *1938
Furnace coke, prompt	$3.75	$3.75	$3.75	$4.00
Foundry coke, prompt	4.75	4.75	4.75	5.00

Non-Ferrous Metals

Cents per Lb. to Large Buyers:	June 6, 1939	May 29, 1939	May 9, 1939	June 7, *1938
Copper, electrolytic, Conn.	10.00	10.00	10.00	9.00
Copper, lake, New York	10.00	10.00	10.00	9.125
Tin (Straits), New York	48.75	49.00	49.25	38.75
Zinc, East St. Louis	4.50	4.50	4.50	4.00
Zinc, New York	4.89	4.89	4.89	4.39
Lead, St. Louis	4.60	4.60	4.60	3.85
Lead, New York	4.75	4.75	4.75	4.00
Antimony (Asiatic), N. Y.	14.00	14.00	14.00	13.75

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
June 6, 1939	2.236c. a Lb.	$20.61 a Gross Ton	$14.58 a Gross Ton
One week ago	2.236	20.61	14.21
One month ago	2.286	20.61	14.25
One year ago	2.487	23.25	11.00
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.	Based on average for basic iron at Valley furnace and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel HIGH	Finished Steel LOW	Pig Iron HIGH	Pig Iron LOW	Steel Scrap HIGH	Steel Scrap LOW
1939	2.286c., Jan. 3	2.236c., May 16			$15.29, Mar. 28	$14.08, May 16
1938	2.512c., May 17	2.211c., Oct. 18	$23.25, June 21	$19.61, July 6	15.00, Nov. 22	11.00, June 7
1937	2.512c., Mar. 9	2.249c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.92, Nov. 10
1936	2.249c., Dec. 28	2.016c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.062c., Oct. 1	2.056c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 29
1934	2.118c., Apr. 24	1.945c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.953c., Oct. 3	1.792c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.915c., Sept. 6	1.870c., Mar. 15	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.981c., Jan. 13	1.883c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.192c., Jan. 7	1.962c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.223c., Apr. 2	2.192c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.192c., Dec. 11	2.142c., July 10	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 9

. . . THIS WEEK'S MARKET NEWS . . .

PRICES

. . . Mills seeking to drive in flat rolled specifications

THE steel industry is still attempting to dig itself out of the debris resulting from the recent flat rolled price war. Most companies are now taking inventory of their commitments and attempting to clean up the situation so that the present published prices will at least be in shape to meet testing later in the year when low priced tonnage taken three weeks ago will have cleared the mills. The present published prices on sheets and strip, while more or less nominal and untested because of the wide coverage at the lower levels, apply to miscellaneous business coming from consumers who did not get in on the ground floor three weeks ago, but such buyers are in the minority and tonnages at present official prices will be small for some time.

Mills are now making adjustments on orders taken during the bargain days and are attempting to drive in specifications on these commitments. Although some success has been made along these lines, it is not expected that large buyers such as the automotive interests will send through their shipping instructions until definite plans for 1940 models have been decided upon. Meanwhile, the hot rolled bar situation is even more unsettled than a week ago, despite the fact that all large bar buyers have had opportunity to cover at the old net price which prevailed before quantity setups were eliminated. Clarification of this situation must come soon.

STEEL OPERATIONS

. . . Average up point to 53%, highest since April

INGOT production this week has gained another point to 53 per cent, the highest level since the week of April 4.

Gains of two points to 51 per cent at Youngstown, two points to 35 per cent at Philadelphia, six points to 71 at Wheeling, and 5 points to 58 in the south Ohio River district have offset declines of a point to 52½ per cent at Chicago, two points to 44½ at Buffalo, and three points in the West to 57 per cent. The Pittsburgh's district operating rate is unchanged at 41 per cent.

At the week's start, the American Iron and Steel Institute estimated ingot output at 54.2 per cent.

NEW BUSINESS

. . . Midwest finds wide tonnage gains over year ago

AS the half-year mark approaches, all lines of the steel industry at CLEVELAND and YOUNGSTOWN are showing impressive tonnage gains over the identical six-month period of 1938. Some lines are around 80 per cent ahead. Raw materials have become much more active. Iron ore shipments have hit their stride after a late start. Limestone sales are considerably ahead of the same period last year. Scrap market activity at CLEVELAND and YOUNGSTOWN during recent weeks has been setting the pace for the Midwest.

Temporarily superseded during the flurry of sheet and strip buying, the heavy steel items used in construction and shipbuilding are now again in the forefront from the standpoint of new business coming to mills.

Start of production upon 1940 model automobiles will supply impetus to a wide range of industries in July and August. Meanwhile, many plants making metal working machinery, compressors and other diversified products are enjoying good activity in OHIO. Particularly impressive are the order backlogs held by factories supplying the aircraft industry, many of them expanding or planning to expand. One Ohio machine tool manufacturer reports May volume exceeded any month since the middle of 1937, the gain being due to domestic business.

Total specifications at PITTSBURGH during the past week increased somewhat from the previous period with most of the improvement resulting from an influx of flat rolled specifications against low priced commitments made three weeks ago. It is expected that sheet and strip specifications will expand materially over the next several weeks. Steel producers are applying pressure to get in final details on low priced flat rolled orders taken during the price war. A considerable number of adjustments and clearing up of misunderstandings are now taking place on sheet and strip business placed three weeks ago.

New business thus far in June has been unimpressive in the CHICAGO territory. Interest in sheets, of course, is negligible except as orders are received against commitments made at the low prices last month. Bars, which were rather strong as a result of activity in plants of tractor makers and cold finishers, are weaker. Plates and structurals are not particularly active, though reinforcing sellers are fairly busy. On June 29, bids will be taken on section S3 of the Chicago subway, which will require 1900 tons of shapes, 3750 tons of reinforcing bars, 540 tons of sheet piling, 395 tons of cast iron and about 28,000 tons of liner plates and ribs.

PIG IRON

. . . June shipments heavier in some districts

PIG iron sales at PITTSBURGH continue at about the same rate as in the past several weeks. Activity is a shade better than was expected but total business being transacted is far from satisfactory with May shipments slightly above April. Shipments in the Chicago area increased appreciably in May over April due to a few large releases. A 10 per cent boost was seen in foundry coke movement due to the coal strike shortage fears. A decline in releases is anticipated this month at CHICAGO, with a pickup in mid-July and August on 1940 automobile activity.

At CLEVELAND small amounts of pig iron have been accepted for third quarter delivery at present prices. Buying is weak, however, and consists principally of only carload orders. Shipments of CLEVELAND sellers started off at roughly the same levels which prevailed in May.

The Mystic Iron Works at Everett, Mass., lighted its furnace late Thursday, June 1, which was one day earlier than anticipated, and made its first tapping Saturday, June 3. The company's shipments against old orders in May was quite satisfactory, and ran ahead of those for May, 1938. Current new business at BOSTON with all furnaces is in carload lots, but there

is a slight increase in the number of sales each week.

Only an occasional carload describes the pace of buying in the NEW YORK area. Shipments of iron on contract have been reduced to a trickle since much iron for June requirements was shipped early in May. There is an export inquiry out for 4500 tons of foundry iron for shipment either to Hamburg or Trieste.

Shipments in May in the PHILADELPHIA area averaged about 20 per cent above April, with June thus far maintaining this better pace. Stove makers and soil and pressure pipe foundries accounted for the bulk of this increased activity. Tonnage orders are virtually absent at CINCINNATI and new business is largely of an urgent type. The Southern Ohio melt still hovers around 50 to 55 per cent of foundry capacity with the machine tool melt most active.

IRON ORE

. . . Shipments in May far exceed like month of 1938

SHIPMENTS of Lake Superior iron ore from upper lake ports during May totaled 3,601,453 gross tons, a gain of 2,420,750 tons from the 1,180,703 tons shipped in May, 1938, according to the Lake Superior Iron Ore Association, Cleveland. Cumulative total for the season to June 1 is 3,658,251 gross tons against 1,441,217 tons up to June 1 last year.

STRUCTURAL STEEL

. . . 4300-ton award for Buffalo building to Bethlehem

AWARDS standing out in an otherwise quiet market the past week included 2680 tons for the Erie Avenue Bridge at Lorain, Ohio, going to Mt. Vernon Bridge Co., Mt. Vernon, Ohio; 2400 tons for the Burr Oak Avenue Viaduct, Chicago, to Bethlehem Steel Co.; 1985 tons for Shasta Dam towers at Redding, Cal., to the American Bridge Co.; 4300 tons to Bethlehem Steel Co. for a Buffalo civic auditorium, and 1150 tons to Lehigh Structural Steel Co. for an addition to Erasmus high School Brooklyn.

In CHICAGO, the volume of jobs involving more than 100 tons is not increasing. The State Street section of the Chicago subway, which includes several stations, will require about 1900 tons of shapes; bids June 29.

Structural steel specifications in the PITTSBURGH district last week expanded slightly from the week before and in view of the heavy tonnages awarded recently, further improvement is anticipated.

SEMI-FINISHED STEEL

. . . Bookings reported at slightly lower level

AT PITTSBURGH in the past week new bookings were off slightly from the previous week's volume but the fluctuation is not considered unusual as consumers persist in buying on a strictly hand-to-mouth basis. A moderate increase in orders from non-integrated mills is anticipated as soon as the latter analyze requirements for recently booked low priced flat rolled tonnage. Holiday inventory factors have influenced sales to some extent recently.

Orders from forgers and non-integrated steel producers continue in roughly the same volume at CLEVELAND as during the latter part of May.

SHIPBUILDING

. . . Navy awards for 12 vessels total $107,131,000

CONTRACTS totaling $107,131,000 for the construction of 12 vessels were awarded to five companies late last week under the Navy's shipbuilding program. At the same time the Navy Department assigned the construction of 12 additional vessels, including two 45,000-ton battleships, to seven navy yards. The 24 ships are expected to require approximately 62,000 tons of plain steel and 34,000 tons of armor plate and will cost an estimated $350,000,000 when equipped with armor and armaments.

The Maritime Commission invited bids to be in on July 11 for the construction of a new series of steel cargo vessels identified as the C-1, which will require about 2650 tons of steel each. The announcement did not disclose how many of the ships would be ordered by the Commission but stipulated that the new ships will be of four types, some with diesel machinery and some turbine-driven.

The following contracts were awarded by the Navy Department to these companies:

Bath Iron Works, $9,626,000 for two destroyers of 1630 tons displacement each;

Federal Shipbuilding & Dry Dock Co., $9,790,000 for two destroyers also of 1630 tons displacement each;

Electric Boat Co., Groton, Conn., $8,811,000 for three submarines of 1475 tons displacement each;

Federal Shipbuilding & Dry Dock Co., $24,252,000 for two light cruisers of 6000 tons displacement each; one to be built in Atlanta, the other in Juneau;

Bethlehem Steel Co., $24,253,000 for two light cruisers of 6000 tons displacement each; one to be built in San Diego, the other in San Juan;

Newport News Va. Shipbuilding & Dry Dock Co., a $31,800,000 contract for one aircraft carrier of 20,000 tons displacement.

These additional ships were assigned for construction in the navy yards indicated:

Two battleships of 45,000 tons displacement; one each to the New York and Philadelphia navy yards;

Four destroyers of 1630 tons displacement; two each to the Boston, and Charleston, S. C., navy yards;

Four submarines—three of 1475 tons and one of 700-ton displacement—three to the Portsmouth, N. H., navy yard; and one of 1475 tons to the Mare Island, Cal., yard.

Two small seaplane tenders of 1650 tons displacement to the Puget Sound, Wash., yard.

Nineteen of the ships ordered were covered in the 1940 program for which funds for their commencement were provided in the Naval Appropriation Act 1940, signed on May 25. Funds for the other five ships were provided by the Second Deficiency Act of 1938 and by the Appropriation Act of 1939.

The Navy Department also awarded a $2,824,575 contract to Fairbanks, Morse & Co., Chicago, for three sets of submarine propelling machinery, and a $2,606,001 contract to the General Motors Corp., Cleveland Diesel Engine Division, for three sets of submarine propelling machinery for which bids were opened on May 26.

WAREHOUSE BUSINESS

. . . Jobbers found gain in May at Cincinnati

ANALYSIS of May jobbers business in the CINCINNATI area, reveals an improvement over the April totals. Warehousemen generally place the improvement at approximately 10

per cent above the previous month's level, with indications that May will rank as one of the best months in the year so far. Business is still predominantly industrial, although seasonal improvement in construction demand is anticipated.

BOLTS, NUTS AND RIVETS

. . . Third quarter price announcements still awaited

CURRENT buying is light at CLEVELAND, with attention of producers centered upon prospects for heavier business when the automotive industry begins production of 1940 models. Bolt and nut producers believe that when volume finally does improve, realized prices may strengthen, especially since consumer inventories are low. Formal announcements of the third quarter price structure are still awaited. In the meantime, the 5 per cent reduction to jobbers on bolts, nuts, and lag screws, initiated at Buffalo for the month of June only, is being met generally by producers.

Rivet manufacturers express the intention of reaffirming present quotations for third quarter orders.

Some cap and set screw consumers have been verbally advised producers will accept third quarter business at second quarter market levels, subject to unforeseen changes.

RAILROAD BUYING

. . . Western Maryland inquires for 1100 freight cars

WESTERN MARYLAND RAILROAD on June 22 will open bids for a maximum of 1110 freight cars, involving 100 to 500 50-ton box, 100 to 500 50-ton hopper, 100 50-ton gondola, and 10 50-ton flat cars. If the maximum number of cars is purchased, it will involve approximately 13,000 tons of steel and wheels. Magor Car Corp., Passaic, N. J., will build 50 box cars for a Costa Rican railroad, which will take 500 tons of steel. Lehigh & New England Railroad is inquiring for 50 to 100 70-ton covered hopper cars which will require from 900 to 1800 tons of steel. Equipment inquiries include five locomotives for United Fruit Co. Florida East Coast is contemplating the purchase of two seven-car streamlined trains.

Reading-Central of New Jersey has ordered 2000 tons of rails from Bethlehem Steel Co.

Equipment orders placed with domestic manufacturers in May total 51 diesel-electric locomotives and 2051 freight cars, according to *Railway Age*. These compare with 2695 freight cars, 19 diesel-electric locomotives and 14 passenger-car trains in April. The cumulative totals of purchases for the present year through May are 144 locomotives, 7753 freight cars and 121 passenger-car trains as against 44 locomotives, 6933 freight cars and 107 passenger-car units in the corresponding period of 1938.

TUBULAR GOODS

. . . Ordering rate unchanged from previous weeks

ALTHOUGH there was a slight bulge in merchant pipe sales and production in PITTSBURGH during the past few weeks, total tubular goods purchases are substantially unchanged from weekly averages over the past few months. Oil-country goods specifications in May were slightly in excess of those placed in April but support from the oil companies is somewhat below what producers had hoped for. Miscellaneous line pipe business is holding up fairly well but no large lines are in the offing at the present time.

In the CLEVELAND and YOUNGSTOWN districts a pick-up has been noted in jobbers' carload orders for mixed sizes of standard pipe. Oil-country demand shows very little change from previous recent weeks.

WIRE PRODUCTS

. . . Producers find incoming tonnage in fair volume

TOTAL incoming tonnage at CLEVELAND remains fair considering all circumstances. Orders for merchant products, manufacturers' wire, and rods all mount up to a decent aggregate weekly figure. Production at CLEVELAND since the start of this month has been averaging a few points lower than during May when it ran around 50 per cent. In the merchant division nails continue to move well but fence orders are slower.

Although total wire specifications have changed but little from a week ago at PITTSBURGH, activity is somewhat less than producers had anticipated. Some of the letdown in manufacturers' wire demand is traced to a drop in buying from automotive centers. New merchant wire business has been affected somewhat in the past few months by the fact that many jobbers covered their requirements substantially before March 1 when prices tightened perceptibly.

May business in CHICAGO was slightly better than April, with the merchant wire division leading the way. June and July, however, are not expected to show any improvement, and may not even equal the 30-day period just passed. Farm buying should hold its present high level for a short time, but a decline is anticipated as summer gets further under way. Chicago sellers are hopeful of sharply increased buying from motor car builders and suppliers in late July and through August.

SHEETS AND STRIP

. . . Automotive releases on flat rolled tonnages lag

SHEET specifications and releases against low priced commitments at PITTSBURGH increased considerably in the past 10 days. Mills are still endeavoring to drive in specifications but the automotive trade is not expected to comply with these requests to any marked extent until later in the summer. Meanwhile, shipments of flat rolled tonnage are expected to increase substantially and most steel producers are building up raw steel requirements. Sheet and strip prices remain nominal and untested except for small tonnages where consumers were not covered three weeks ago. This same situation applies to galvanized sheets, both flat and formed, where clean-ups on low priced business were fairly well completed about a week ago.

At CLEVELAND new orders for sheets and strip continue sparse, although cold rollers are releasing moderately heavier.

In only one or two cases are CHICAGO sales offices taking new business in sheets and strip at the new base prices, the tonnage involved being small. One mill reports that a few of its moderately large users of sheets refused to take advantage of the low prices last month and are now buying at the current prices in normal quantities. One mill had set a deadline of June 30 for shipment of low priced sheets and strip as opposed to the Oct. 1 limit established by several other producers.

Miscellaneous users are still very

active in SOUTHERN OHIO where the galvanized demand, while not in a heavy proportion as heretofore, continues a bright spot.

In the NEW YORK metropolitan area sellers report specifications coming in on low priced tonnages at a rate higher than anticipated. The fact that immediate shipment is asked for in several instances would indicate that some consumers had held off their normal commitments until full advantage could be taken of the market break. According to the present stand of the mills, specifications will be accepted up to the time where shipment can be completed by Sept. 30. New buying is absent.

PLATES

. . . Prospects fair for future activity in Central Area

AMONG prospects for activity in the CLEVELAND district are Republic Steel Corp.'s decision to rebuild its Trumbull Cliffs furnace and another section of the Toledo municipal pipeline which will be up for bids in July. Warren City Tank & Boiler Works has been awarded a 1,145,000-gal. standpipe for the city of Warren, Ohio.

Current bookings of plates in the Philadelphia district are mostly from small fabricators, there having been no recent placement of any sizable tonnages by either the railroads or the shipbuilders. The Pennsylvania, however, is considering the repair of 100 locomotives which will account for a substantial tonnage of plates. Domestic prices on small lots are adhering fairly closely to the 2.10c. level, but on carlots and larger concessions of from $2 to $3 a ton are not unusual. Chief export demand at present is emanating from the Scandinavian countries. In addition to a lot of 2800 tons recently booked by an eastern Pennsylvania mill, another 3000 tons from this source is still pending. It is understood that prices offered on this latter tonnage range from 1.63c. to 1.65c., f.a.s. On small export tonnages prices have been ranging between 1.67c. and 1.70c., f.a.s.

Chief interest in the Chicago district is being shown in light gage plates. The Illinois Central is inquiring for 1000 cars, and the Northwestern is considering the purchase of 800 cars. Tank makers continue to be the only consistent buyers of plate in the NEW YORK area, but none of the tonnages are large.

REINFORCING BARS

. . . Housing project material to be provided by Truscon

SIZABLE awards the past week were limited to 1275 tons for the Commodore Perry housing project, Buffalo, and 1600 tons for the East Side Drive, New York, both jobs going to Truscon Steel Co., Youngstown.

Bids will be taken June 29 on Section S-3 of the CHICAGO subway, requiring 3750 tons. A channel improvement in the Canisteo River at Hornell, N. Y., will take 1200 tons. Concrete bar prices in the past week, while generally coming within the quoted $5 a ton range on new billet reinforcing and $4 a ton range on steel rail bars, were sold below these ranges at Philadelphia and Washington.

MERCHANT BARS

. . . Price situation unchanged despite consumers' pressure

ALTHOUGH not increasing to any marked degree, bar bookings at PITTSBURGH continue to reflect substantial diversification. With purchases restricted to absolute necessities in many cases, individual bookings are not large. A heavier movement of bars is expected when auto makers start production on new models.

The price situation on hot rolled bars whereby large buyers are to pay $1 a ton more for third quarter business continues highly unsettled and clarification of the entire question must come soon. Meanwhile, practically all large bar buyers are able to take advantage of the old net price during the remainder of this month and it is understood that large coverages have been made.

At CLEVELAND, where few large merchant bar users are situated, buying is well maintained but not unusually strong. Consumers currently are being given the advantage of whichever price figure is lowest prior to elimination of the quantity allowance. Anticipated tonnage is not heavy. Test of the proposed $1 per ton increase to large consumers is considered some weeks in the future.

TIN PLATE

. . . Releases continue in fair volume; operations hold

RELEASES from can makers continue in fair volume and are substantial enough to maintain tin plate operations at 70 per cent, unchanged from last week. Of interest to fishermen and a recent innovation, is the canning of fat angleworms. The bait, which is packed in moist peat moss, is said to remain fresh in the cans as long as 60 days.

Buying in the PHILADELPHIA district has been featured by some light covering by canners in preparation for the approaching tomato crop.

The Bleakley Corp., 229-31 First St., Toledo, Ohio, has been formed to exploit a new process of manufacturing molds for die casting, plastics, rubber and porcelain molding. Details of the new process have not been disclosed. L. D. Soubier, consulting engineer and inventor with the Owens-Illinois Glass Co., and P. A. Bleakley, vice-president, are leaders in the new company. Costs of the new process bring molds down to about 10 per cent of expense of older methods, it is said.

Weekly Bookings of Construction Steel

	Week Ended				Year to Date	
	June 6, 1939	May 29, 1939	May 9, 1938	June 7, 1938	1939	1938
Fabricated structural steel awards	21,900	35,215	28,650	18,750	459,575	297,450
Fabricated plate awards	2,990	1,610	12,750	6,525	74,995	61,840
Steel sheet piling awards	175	1,400	2,775	800	23,580	14,150
Reinforcing bar awards	7,800	7,400	10,350	2,660	214,995	98,120
Total Letting of Construction Steel..	32,865	45,625	54,525	28,735	773,145	471,560

IRON AND STEEL SCRAP

. . . Principal markets are stronger, although sales into consumption continue light . . . Composite advances 37c. to $14.58.

JUNE 6—A Chicago mill entered the market last week, paying $13.50 for No. 1 steel, up 50c. from the last mill purchase and on Tuesday a sale was made at $14, raising the average 75c. from the flat $13 quoted last week. At Pittsburgh the market is also stronger, based largely on broker-dealer transactions.

Youngstown continues strong and has even attracted material from the Pittsburgh district. Cleveland mills are buying and some prices are up there, among them those for railroad specialties, some of which went for export. Railroad items are also stronger at Pittsburgh. Bids on bundles at Detroit sold for 50c. or more over previous lists, but bundles sold at Philadelphia were weaker. Domestic activity at the latter point continues at a low level, and the market continues to be supported by buying for export. As a result of these changes, THE IRON AGE composite price has risen 37c. to $14.58 from $14.21 the week before.

Temporarily an anomalous situation exists in the export market. The arrival of an unprecedented number of boats at Boston and other New England ports has resulted in a very strong market there, while an unforeseen falling off in the number of vessels arriving at New York has slowed up gathering operations there and has tended to weaken the market. To offset this condition at least one Boston boat has been sent to New York.

Pittsburgh

Despite the fact that little or no consumer buying has taken place in the immediate Pittsburgh district, the market is somewhat stronger than a week ago. No. 1 heavy melting steel is quotable this week at $14.50 to $15, up 37½c. a ton from last week's average. Brokers are able to get only small tonnages of this grade at $14.50 and in some cases are paying more than this figure. Meanwhile, some consuming points in the district are paying the equivalent of $15 a ton or more for No. 1 heavy melting. An unusual situation has arisen where some No. 1 heavy melting steel has been shipped to the Youngstown district where brokers have paid $15 a ton. Two recent railroad lists are reported to have brought $16 a ton for export, and some railroad scrap has been sold into consumption at around $16.50 a ton. Two railroad lists involving very small tonnages and with a limited territory to sell in went during the past week at $15 a ton on tracks. Specialties are also stronger.

Chicago

Heavy melting steel was sold to a district mill last week for $13.50 a gross ton delivered. Late on Tuesday, a sale was made at $14. Most of the items in the Chicago list moved upward this week in sympathy with the advance in No. 1 steel.

Philadelphia

Domestic demands for steel making grades here continue very light, the market deriving practically all its present firmness from active export demands. No. 1 steel remains unchanged at $15 to $15.50, but mill interest in No. 2 grade, coupled with not too plentiful supplies, makes it unlikely that less than $13 could be done on this material. There have been some small tonnages moved at this level, but none any higher, consequently No. 2 is currently quoted at a flat $13. The recent flurry in machine shop turnings has died out and the last sale indicates a top of $8.50 on this material, down 50c. from the previous week's level. Buying of cast grades has been dormant for some time, hence quotations on these items are essentially nominal. The last Budd list of 2800 tons of compressed bundles went at around $14 a ton, Philadelphia.

Youngstown

The market continues in a strong position here with No. 1 steel at $14.75 to $15.25 per ton, the result of purchases previously recorded. Further activity is expected on the part of mills whose production schedules are improving. The Erie railroad scrap sold last week is coming to the district at $15 per ton.

Cleveland

Activity continues on the uptrend here. Two mills in the district have placed orders during the past week, one for borings and turnings, and the other for open-hearth grades. Published prices on open-hearth grades are unchanged, although the situation is tighter than at any time in the past two months and it is doubtful if the next purchases can be made at current quotable levels. Borings and turnings and allied grades are up 75c. per ton. Railroad grate bars and short rails are up sharply on the basis of the principal local railroad list, but iron car wheels and malleable are unchanged.

Buffalo

As yet no apparent promotion in scrap sales has been effected by the improved ingot rate. One mill has moved from partial restriction to complete suspension of shipments. The market remains steady at the present levels in the absence of activity. Dealer sentiment is fair.

St. Louis

The scrap iron market is quiet, with an undertone of strength. While no deals are pending, dealers are inclined to believe that the consumption in the St. Louis district indicates early buying. Not much material is coming in from the country. No. 1 machinery cast is up $1, while railroad malleable is 25c. lower. Railroad lists: Baltimore & Ohio, 5800 tons; Wabash, 2000 tons; Missouri Pacific, 1300 tons; New York, Chicago and St. Louis, 1300 tons; Alton, 300 tons, and Ann Arbor, 300 tons.

Cincinnati

Improved dealer feeling still pervades the local old materials market, but business activity fails to give any tangible basis for the present firmer undertone. Dealers bids are still unchanged for the second consecutive week since the trade is not bidding aggressively for available material. Mill interest in new contracts is almost nil, although shipments against old commitments are reported to be good.

New York

Delay in arrival in vessels for loading in the past week and the presence of large quantities of scrap on barges in keeping with the recent increase in the tempo of shipments abroad has tended to weaken the export market in this area. Although there is no change in the market pricewise, some material is going begging at the moment. Cast grades are particularly weak. Domestically, some strength is seen, although the volume of shipments to eastern Pennsylvania is still small.

Boston

Activity in the export market is gathering headway and prices are very firm on a basis of generally $14 a ton delivered dock for No. 1 steel and $12.75 to $13 a ton for No. 2. Three boats are loading here and are expected to clear this week. Indications are there will be a steady flow of steamers to this port during the remainder of June and that the month will be one of the heaviest on record. One boat now loading is taking on scrap after regular hours in an effort to relieve the congestion of scrap waiting shipment. Aside from an occasional car and truckload of textile and machinery cast, the movement of scrap for domestic consumption is practically at a standstill.

Detroit

Greatly improved sentiment on the part of dealers and brokers moved prices upward on early June automotive lists 25c. to 50c. on most items. Some bundles were sold above $11.50 per ton, but the major part of the bundle tonnage was sold around the $11.50 figure. There is no activity at present in No. 1 heavy melting steel although No. 2 is being handled at $9 on track. Continued small shipments of blast furnace scrap keep this item moving steadily and showing slight increases in price.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$14.50 to $15.00
Railroad hvy. mltng.	16.00 to 16.50
No. 2 hvy. mltng. steel.	13.25 to 13.75
Scrap rails	16.00 to 16.50
Rails 3 ft. and under	17.50 to 18.00
Comp. sheet steel	14.50 to 15.00
Hand bundled sheets	13.50 to 14.00
Hvy. steel axle turn.	13.00 to 13.50
Machine shop turn.	9.00 to 9.50
Short shov. turn.	9.50 to 10.00
Mixed bor. & turn.	6.50 to 7.00
Cast iron borings	6.50 to 7.00
Cast iron carwheels	14.50 to 15.00
Hvy. breakable cast.	12.00 to 12.50
No. 1 cupola cast.	15.00 to 15.50
RR. knuckles & cplrs.	17.50 to 18.00
Rail coil & leaf springs	18.00 to 18.50
Rolled steel wheels	18.00 to 18.50
Low phos. billet crops.	18.50 to 19.00
Low phos. punchings.	17.00 to 17.50
Low phos. plate	16.00 to 17.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$15.00 to $15.50
No. 2 hvy. mltng. steel.	13.00
Hydraulic bund., new.	14.50 to 15.00
Hydraulic bund., old.	11.00 to 11.50
Steel rails for rolling.	17.00 to 17.50
Cast iron carwheels	16.00
Hvy. breakable cast.	14.50 to 15.00
No. 1 cast	16.00 to 16.50
Stove plate (steel wks.)	12.50 to 13.00
Railroad malleable	15.50 to 16.00
Machine shop turn.	8.00 to 8.50
No. 1 blast furnace.	6.50 to 7.00
Cast borings	6.50 to 7.00
Heavy axle turnings	10.00 to 10.50
No. 1 low phos. hvy.	17.00 to 17.50
Couplers & knuckles	17.00 to 17.50
Rolled steel wheels	17.00 to 17.50
Steel axles	20.00 to 20.50
Shafting	20.50 to 21.00
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire	12.00 to 12.50
Cast borings (chem.)	9.50 to 10.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy. mltng. steel	$13.50 to $14.00
Auto. hvy. mltng. steel al'oy free	12.00 to 12.50
No. 2 auto steel	10.50 to 11.00
Shoveling steel	13.50 to 14.00
Factory bundles	12.50 to 13.00
Dealers' bundles	11.50 to 12.00
Drop forge flashings	9.50 to 10.00
No. 1 busheling	12.00 to 12.50
No. 2 busheling, old	5.25 to 5.75
Rolled carwheels	14.50 to 15.00
Railroad tires, cut	15.00 to 15.50
Railroad leaf springs	14.50 to 15.00
Steel coup. & knuckles	14.25 to 14.75
Axle turnings	12.50 to 13.00
Coil springs	16.50 to 17.00
Axle turn. (elec.)	13.50 to 14.00
Low phos. punchings	15.50 to 16.00
Low phos. plates 12 in. and under	15.00 to 15.50
Cast iron borings	6.50 to 7.00
Short shov. turn.	6.50 to 7.00
Machine shop turn.	6.50 to 7.00
Rerolling rails	18.00 to 18.50
Steel rails under 3 ft.	16.00 to 16.50
Steel rails under 2 ft.	16.50 to 17.00
Angle bars, steel	15.25 to 15.75
Cast iron carwheels	12.50 to 13.00
Railroad malleable	15.00 to 15.50
Agric. malleable	12.00 to 12.50

	Per Net Ton
Iron car axles	$18.00 to $18.50
Steel car axles	17.50 to 18.00
Locomotive tires	13.00 to 13.50
Pipes and flues	8.50 to 9.00
No. 1 machinery cast.	12.00 to 12.50
Clean auto. cast	12.50 to 13.00
No. 1 railroad cast.	11.00 to 11.50
No. 1 agric. cast	10.00 to 10.50
Stove plate	7.75 to 8.25
Grate bars	7.75 to 8.25
Brake shoes	9.50 to 10.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$14.75 to $15.25
No. 2 hvy. mltng. steel.	13.75 to 14.25
Low phos. plate	15.75 to 16.25
No. 1 busheling	14.00 to 14.50
Hydraulic bundles	14.25 to 14.75
Machine shop turn.	8.50 to 9.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$13.75 to $14.25
No. 2 hvy. mltng. steel	12.75 to 13.25
Comp. sheet steel.	13.25 to 13.75
Light bund. stampings	9.50 to 10.00
Drop forge flashings.	11.25 to 11.75
Machine shop turn.	7.25 to 7.75
Short shov. turn.	7.50 to 8.00
No. 1 busheling	12.75 to 13.25
Steel axle turnings	10.50 to 11.00
Low phos. billet and bloom crops	17.50 to 18.00
Cast iron borings	8.00 to 8.50
Mixed bor. & turn.	8.00 to 8.50
No. 2 busheling	8.25 to 8.75
No. 1 cupola cast	15.50 to 16.00
Railroad grate bars	11.00 to 11.50
Stove plate	9.00 to 9.50
Rails under 3 ft.	17.75 to 18.25
Rails for rolling	17.50 to 18.00
Railroad malleable	15.00 to 15.50
Cast iron carwheels	13.50 to 14.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$13.00 to $13.50
Railroad hvy. mltng.	13.50 to 14.00
No. 2 hvy. mltng. steel.	11.00 to 11.50
Scrap rails	13.50 to 14.00
New hvy. b'ndled sheets	11.00 to 11.50
Old hydraul. bundles.	10.00 to 10.50
Drop forge flashings.	11.00 to 11.50
No. 1 busheling	11.00 to 11.50
Machine shop turn.	6.00 to 6.50
Knuckles & couplers.	15.00 to 15.50
Coil & leaf springs.	15.00 to 15.50
Rolled steel wheels.	15.00 to 15.50
Shov. turnings	7.00 to 7.50
Mixed bor. & turn.	7.00 to 7.50
Cast iron borings	7.00 to 7.50
No. 1 machinery cast.	15.00 to 16.00
No. 1 cupola cast.	14.50 to 15.00
Stove plate	13.00 to 13.50
Steel rails under 3 ft.	18.00 to 18.50
Cast iron carwheels	13.50 to 14.00
Railroad malleable	15.00 to 15.50

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting.	$11.75 to $12.25
No. 1 hvy. melting.	11.50 to 12.00
No. 2 hvy. melting.	10.50 to 11.00
No. 1 locomotive tires.	12.25 to 12.75
Misc. stand. sec. rails.	13.00 to 13.50
Railroad springs	14.00 to 14.50
Bundled sheets	7.00 to 7.50
No. 1 busheling	7.50 to 8.00
Cast. bor. & turn.	2.50 to 3.00
Machine shop turn.	3.50 to 4.00
Heavy turnings	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Steel car axles	17.00 to 17.50
No. 1 RR. wrought.	9.75 to 10.25
No. 2 RR. wrought.	11.50 to 12.00
Steel rails under 3 ft.	16.00 to 16.50
Steel angle bars	13.00 to 13.50
Cast iron carwheels.	14.00 to 14.50
No. 1 machinery cast.	14.50 to 15.00
Railroad malleable	12.00 to 12.50
No. 1 railroad cast.	12.00 to 12.50
Stove plate	7.50 to 8.00
Grate bars	8.50 to 9.00
Brake shoes	9.50 to 10.00

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel.	$10.50 to $11.00
No. 2 hvy. mltng. steel.	8.25 to 8.75
Scrap rails for mltng.	14.00 to 14.50
Loose sheet clippings.	6.00 to 6.50
Hydrau. b'ndled sheets	10.00 to 10.50
Cast iron boring	2.75 to 3.25
Machine shop turn.	4.00 to 4.50
No. 1 busheling	6.75 to 7.25
No. 2 busheling	1.75 to 2.25
Rails for rolling	16.00 to 16.50
No. 1 locomotive tires.	12.75 to 13.25
Short rails	16.75 to 17.25
Cast iron carwheels	12.00 to 12.50
No. 1 machinery cast.	11.50 to 12.00
No. 1 railroad cast.	11.50 to 12.00
Burnt cast	5.75 to 6.25
Stove plate	5.75 to 6.25
Agricul. malleable	10.25 to 10.75
Railroad malleable	12.75 to 13.25
Mixed hvy. cast	10.00 to 10.50

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel.	$12.50 to $14.00
Scrap steel rails	14.50 to 15.00
Short shov. turnings.	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR, wrought	.... 10.00
Rails for rolling	16.00 to 16.50
No. 1 cast	.... 14.50
Tramcar wheels	.... 14.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. industrial steel	$9.50 to $10.00
No. 2 hvy. mltng. steel.	8.50 to 9.00
Borings and turnings.	5.00 to 5.50
Long turnings	4.50 to 5.00
Short shov. turnings.	5.25 to 5.75
No. 1 machinery cast.	12.50 to 13.00
Automotive cast	13.00 to 13.50
Hvy. breakable cast.	9.00 to 9.50
Stove plate	7.50 to 8.00
Hydraul. comp. sheets.	11.00 to 11.50
New factory bushel.	9.50 to 10.00
Sheet clippings	7.00 to 8.00
Flashings	9.50 to 10.00
Low phos. plate scrap.	11.00 to 11.50

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel.	$11.00 to $11.50
No. 2 hvy. mltng. steel.	8.50 to 9.00
Hvy. breakable cast.	10.50 to 11.00
No. 1 machinery cast.	11.50 to 12.00
No. 2 cast	9.50 to 10.00
Stove plate	9.50 to 10.00
Steel car axles	20.00 to 20.50
Shafting	15.50 to 16.00
No. 1 RR. wrought.	11.00 to 11.50
No. 1 wrought long.	9.50 to 10.00
Spec. iron & steel pipe	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Clean steel turnings*	4.00 to 4.50
Cast borings*	3.50 to 4.00
No. 1 blast furnace.	3.50 to 4.00
Cast borings (chem.)	9.50 to 10.00
Unprepared yard scrap	6.00 to 6.50
Light iron	3.00 to 3.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast†	$13.50 to $14.00
No. 2 cast†	10.50 to 11.00

* $1.50 less for truck loads.
† Northern N. J. prices are $2 to $2.50 higher

BOSTON

Dealers' buying prices per gross ton:

Breakable cast	.... $9.65
Machine shop turn.	$3.38 to $4.15
Mixed bor. & turn.	2.00 to 2.25
Bun. skeleton long.	.... 7.15
Shafting	15.25 to 15.50
Cast bor. chemical.	4.50 to 5.00
Per gross ton delivered consumers' yards:	
Textile cast	$13.00 to $14.00
No. 1 machine cast.	13.00 to 14.00
Per gross ton delivered dea'ers' yards:	
No. 1 hvy. mltng. steel.	$11.25 to $11.50
No. 2 steel	10.00 to 10.25

PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$12.00 to $13.00
No. 2 hvy. mltng. steel.	11.00 to 12.00

CANADA

Dealers' buying prices at their yards, per gross ton:

	Toronto	Montreal
No. 1 hvy. mltng. steel.	$9.25	$8.75
No. 2 hvy. mltng. steel.	8.00	7.50
Mixed dealers steel.	6.75	6.25
Drop forge flashings.	8.25	7.75
New loose clippings.	4.25	3.75
Busheling	3.75	3.25
Scrap pipe	4.25	3.75
Steel turnings	4.25	3.75
Cast borings	3.75	3.25
Machinery cast	14.00	13.50
Dealers cast	12.00	11.50
Stove plate	10.00	9.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges

No. 1 hvy. mltng. steel.	$12.00 to $12.50
No. 2 hvy. mltng. steel.	10.50 to 11.00
No. 2 cast	10.50 to 11.00
Stove plate	9.50 to 10.00

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel.	$13.75 to $14.00
No. 2 hvy. mltng. steel.	12.75 to 13.00
Rails (scrap)	13.75 to 14.00

Philadelphia, delivered alongside boats, Port Richmond.

No. 1 hvy. mltng. steel.	$15.00 to $15.25
No. 2 hvy. mltng. steel.	13.50 to 13.75

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

Steel prices on these pages are base prices only and **f.o.b. mill** unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases the amount of freight which must be absorbed in order to meet competition.

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are $2 higher. F.o.b. Duluth, billets only, $2 higher.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods
(No. 5 to 9/32 in.)

	Per Gross Ton
Pittsburgh, Chicago or Cleveland	$43.00
Worcester, Mass.	45.00
Birmingham	43.00
San Francisco	52.00

Rods over 9/32 in. or 47/64 in., inclusive, $5 a ton over base.

SOFT STEEL BARS

	Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Buffalo and Birmingham	2.15c.
Detroit, delivered	2.25c.
Duluth	2.25c.
Philadelphia, delivered	2.47c.
New York	2.49c.
On cars dock Gulf ports	2.50c.
On cars dock Pacific ports	2.75c.

Due to elimination of quantity discount for third quarter business, large buyers are to pay $1 a ton more than previously. Most of these large consumers will have been covered at the old net price on orders taken previous to July 1 when the elimination of the quantity discount is slated to go into effect.

RAIL STEEL BARS
(For merchant trade)

Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.00c.
On cars dock Tex. Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

BILLET STEEL REINFORCING BARS
(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Cleveland, Youngstown or Sparrows Pt.	1.80c. to 2.05c.
Detroit, delivered	1.90c. to 2.15c.
On cars dock Tex. Gulf ports	2.15c. to 2.40c.
On cars dock Pacific ports	2.50c.

RAIL STEEL REINFORCING BARS
(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Buffalo, Cleveland, Youngstown or Birmingham	1.70c. to 1.90c.
Detroit, delivered	1.80c. to 2.00c.
On cars dock Tex. Gulf ports	2.05c. to 2.25c.
On cars dock Pacific ports	2.35c.

IRON BARS

Chicago and Terre Haute	2.15c.
Pittsburgh (refined)	3.60c.

COLD FINISHED BARS AND SHAFTING*

	Base per Lb.
Pittsburgh, Buffalo, Cleveland, Chicago and Gary	2.65c.
Detroit	2.70c.

* In quantities of 10,000 to 19,999 lb.

PLATES

	Base per Lb.
Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont, Del.	2.10c.*
Philadelphia, del'd	2.15c.
New York, del'd	2.19c. to 2.29c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.60c.
Wrought iron plates, P'tg.	3.80c.

* Subject to concessions, particularly in the East, of $2 a ton.

FLOOR PLATES

Pittsburgh or Chicago	3.35c.
New York, del'd	3.71c.
On cars dock Gulf ports	3.70c.
On cars dock Pacific ports	3.95c.

STRUCTURAL SHAPES

	Base per Lb.
Pittsburgh, Chicago, Gary, Buffalo, Bethlehem or Birmingham	2.10c.
Philadelphia, del'd	2.215c.
New York, del'd	2.27c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

STEEL SHEET PILING

	Base per Lb.
Pittsburgh, Chicago or Buffalo	2.40c.
On cars dock Gulf ports	2.85c.
On cars dock Pacific ports	2.90c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$40.00
Angle bars, per 100 lb.	2.70

F.o.b. Basing Points

Light rails (from billets) per gross ton	$40.00
Light rails (from rail steel) per gross ton	39.00

	Base per Lb.
Cut spikes	3.00c.
Screw spikes	4.55c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast ports	2.25c.
Track bolts, to steam railroads	4.15c.
Track bolts to jobbers, all sizes (per 100 counts)	65-5

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS

Hot Rolled

	Base per Lb.
Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown or Chicago	2.00c.
Detroit, delivered	2.10c.
Philadelphia, delivered	2.17c.
Granite City	2.10c.
On cars dock Pacific ports	2.50c.
Wrought iron, Pittsburgh	4.10c.

Cold Rolled*

Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown or Chicago	3.05c.
Detroit, delivered	3.15c.
Granite City	3.15c.
Philadelphia, delivered	3.37c.
On cars dock Pacific ports	3.65c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

From May 10 up to and including May 15, reductions from the base price of hot and cold rolled sheets running from $4 to $8 a ton were prevalent. Concessions withdrawn, on May 15.

Galvanized Sheets, 24 Gage

Pittsburgh, Chicago, Gary Sparrows Point, Buffalo, Middletown, Youngstown or Birmingham	3.50c.
Philadelphia, delv'd	3.67c.
Granite City	3.60c.
On cars dock Pacific ports	4.00c.
Wrought iron Pittsburgh	6.10c.

Electrical Sheets
(*F.o.b. Pittsburgh*)

	Base per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extra plus 25c per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

Long Ternes

No. 24 unassorted 8-lb. coating f.o.b. Pittsburgh or Gary	3.80c.
F.o.b. cars dock Pacific ports	4.50c.

Vitreous Enameling Stock, 20 Gage*

Pittsburgh, Chicago, Gary, Youngstown, Middletown or Cleveland	3.35c.
Detroit, delv'd	3.45c.
Granite City	3.45c.
On cars dock Pacific ports	3.95c.

TIN MILL PRODUCTS

***Tin Plate**

	Per Base Box
Standard cokes, Pittsburgh, Chicago and Gary	$5.00
Standard cokes, Granite City	5.10

* Prices effective Nov. 10 on shipments through first quarter of 1939.

Special Coated Manufacturing Ternes

	Per Base Box
Granite City	$4.40
Pittsburgh or Gary	4.30

Roofing Terne Plate
(*F.o.b. Pittsburgh*)
(Per Package, 112 sheets, 20 x 28 in.)

8-lb. coating I.C.	$12.00
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.00
25-lb. coating I.C.	16.00
30-lb. coating I.C.	17.25
40-lb. coating I.C.	19.50

Black Plate, 29 gage and lighter

Pittsburgh, Chicago and Gary	3.05c.
Granite City	3.15c.
On cars dock Pacific ports, boxed	4.00c.

HOT ROLLED STRIP
(*Widths up to 12 in.*)

	Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown or Birmingham	2.00c.
Detroit, delivered	2.10c.

Cooperage Stock

Pittsburgh & Chicago	2.10c.

From May 10 up to and including May 15, reductins in the base price of hot rolled strip running from $4 to $8 a ton were prevalent. Concessions withdrawn on May 15.

COLD ROLLED STRIP*

	Base per Lb.
Pittsburgh, Youngstown or Cleveland	2.80c.
Chicago	2.90c.
Detroit, delivered	2.90c.
Worcester	3.00c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

Pittsburgh, Youngstown, or Cleveland	2.95c.
Detroit, delivered	3.05c.
Worcester	3.35c.

From May 10 up to and including May 15, reductions from the base price of cold rolled strip amounting to $4 a ton were prevalent. Concessions withdrawn on May 15.

COLD ROLLED SPRING STEEL

		Pittsburgh and Cleveland	Worcester
Carbon	0.26-0.50%	2.80c.	3.00c.
Carbon	0.51-0.75	4.30c.	4.80c.
Carbon	0.76-1.00	6.15c.	6.35c.
Carbon	1.01-1.25	8.35c.	8.55c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh, Chicago, Cleveland and Birmingham)

To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Galvanized wire, base	2.65c.*
Spring wire	3.20c.

* On galvanizing wire to manufacturing trade, size and galvanizing extras are charged, the price Nos. 6 to 9 gage, inclusive, thus being 3.15c.

To the Trade

	Base per Keg
Standard wire nails	$2.45
Coated nails	2.45
Cut nails, carloads	3.60

	Base per 100 Lb.
Annealed fence wire	$2.95
Galvanized fence wire	3.35
Polished staples	3.15
Galvanized staples	3.40
Twisted barbless wire	3.30
Woven wire fence, base column.	67
Single loop bale ties, base col...	56
Stand. 2 pt., 12.5 gage barbed cattle wire, per 80 rod spool	$2.62
Stand. 2 pt., 12.5 gage barbed hog wire, per 80 rod spool	$2.80

Note: Birmingham base same on above items, except spring wire.

Add $4 a ton for Mobile, Ala.; $5 for New Orleans; $6 for Lake Charles to above bases, except on galvanized and annealed merchant fence wire, which are $1 a ton additional in each case.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel In.	Black	Galv.	*Wrought Iron* In.	Black	Galv.
⅛	56	36	¼ & ⅜	..+9	+30
¼ to ⅜	.59	43½	½	24	6½
½	.....63½	54	¾	30	13
¾	.....66½	58	1 & 1¼	.34	19
1 to 3	..68½	60½	1½	38	21½
			2	.....37½	21

Lap Weld

2	61	52½	2	.....30½	15
2½ & 3	..64	55½	2½ to 3½	31½	17½
3½ to 6.66		57½	4	.....33½	21
7 & 8.65		55½	4½ to 8.32	½	20
9 & 10.64	½	55	9 to 12	..28½	15
11 & 12.63	½	54			

Butt weld, extra strong, plain ends

⅛	.....54½	41½	¼ & ⅜	.+10	+43
½ to ⅜	.56½	45½	½	25	9
½	.....61½	37½	¾	31	15
¾	.....65½	57½	1 to 2	...38	22½
1 to 3	...67	60			

Lap weld, extra strong, plain ends

2	59	51½	2	.....33½	18½
2½ & 3	..63	55½	2½ to 4.39	½	25½
3½ to 6.66	½	59	4½ to 6.37	½	24
7 & 8.65	½	56	7 & 8	..38½	24½
9 & 10.64	½	55	9 to 12	..32	20½
11 & 12.63	½	54			

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher, on all butt weld 8 in. and smaller.

Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall.

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld Hot Rolled
1 in. o.d....13 B.W.G.	$ 9.01	$ 7.82	....
1¼ in. o.d...13 B.W.G.	10.67	9.26	....
1½ in. o.d...13 B.W.G.	11.70	10.22	$9.72
1¾ in. o.d...13 B.W.G.	13.42	11.64	11.06
2 in. o.d.....13 B.W.G.	15.03	13.04	12.38
2¼ in. o.d...13 B.W.G.	16.76	14.54	13.79
2¼ in. o.d...12 B.W.G.	18.45	16.01	15.16
2½ in. o.d...12 B.W.G.	20.21	17.54	16.58
2¾ in. o.d...12 B.W.G.	21.42	18.59	17.54
3 in. o.d.....12 B.W.G.	22.48	19.50	18.35
3½ in. o.d...11 B.W.G.	28.37	24.62	23.15
4 in. o.d.....10 B.W.G.	35.20	30.54	28.66
4½ in. o.d...10 B.W.G.	43.04	37.35	35.22
5 in. o.d..... 9 B.W.G.	54.01	46.87	44.25
6 in. o.d..... 7 B.W.G.	82.93	71.96	68.14

Extras for less carload quantities:

40,000 lb. or ft. over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago.	$51.00
6-in. and larger, del'd New York	49.00
*6-in. and larger, Birmingham.	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	52.00
F.o.b. dock, Seattle	52.00
4-in. f.o.b. dock, San Francisco or Los Angeles	55.00
F.o.b. dock, Seattle	52.00

Class "A" and gas pipe, $3 extra 4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $42, Birmingham, and $50 delivered Chicago and 4-in. pipe, $45, Birmingham, and $54 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland Birmingham or Chicago)

	Per Cent Off List
Machine and carriage bolts:	
½ in. & 6 in. and smaller	68½
Larger and longer up to 1 in.	66
1⅛ in. and larger	64
Lag bolts	66
Plow bolts, Nos. 1, 2, 3 and 7	68½
Hot pressed nuts, and c.p.c. and t-nuts, square or hex. blank or tapped:	
½ in. and smaller	67
9/16 in. to 1 in. inclusive	64
1⅛ in. and larger	62

On the above items with the exception of plow bolts, there is an additional allowance of 10 per cent for full container quantities.

On all of the above items, there is an additional 5 per cent allowance for carload shipments.

	U.S.S.	S.A.E.
Semi-fin. hexagon nuts		
½ in. and smaller	67	70
9/16 to 1 in.	64	65
1⅛ in. and larger	62	62

In full container lots, 10 per cent additional discount.

Stove bolts in packages, nuts attached	72½
Stove bolts in packages, with nuts separate	72½ and 12½
Stove bolts in bulk	84

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½ in. and larger)

	Base Per 100 Lb.
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$3.40

Small Rivets

(7/16 in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh, Cleveland Chicago, Birmingham	65 and 10

Cap and Set Screws

(Freight allowed to destination)

	Per Cent Off List
Milled hexagon head, cap screws, 1 in. dia. and smaller	50 and 10
Milled headless set screws, cut thread ¾ in. and smaller	70
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	67½
Upset set screws, cup and oval points	75
Milled studs	60

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, $56.00 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	2.70c.
Delivered, Detroit	2.80c.

S.A.E. Series Numbers	Alloy Differential per 100 Lb.
200 (½% Nickel)	$0.35
2100 (1½% Nickel)	$0.75
2300 (3½% Nickel)	1.55
2500 (5% Nickel)	2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.95
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.30
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel - molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni.)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel vanadium	1.50
Carbon-vanadium	0.35

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.35c. base per lb. Delivered Detroit, 3.45c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets	26.50c.	29c.	32.50c.	36.50c.
Hot Strip	17c.	17.50c.	24c.	35c.
Cold stp.	22c.	22.50c.	32c.	52c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c a lb. higher.

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, export	Nominal
Tin plate, per base box	20s. 3d. to 21s. 6d.
Steel bars, open hearth	£10 8s.
Beams, open-hearth	£10
Channels, open hearth	£10 5s.
Angles, open-hearth	£10
Black sheets, No. 24 gage.	£13
Galvanized sheets, No. 24 gage	£15 15s.

CONTINENTAL

Per Gross Ton, Gold £, f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet Bars	Nominal
Plate ¼ in. and up	£5 7s.
Plate 3/16 in. and 5 mm.	£5 13s.
Sheets ⅛ in.	£5 9s. 6d
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£5 12s.

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$22.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	22.00
Delivered Brooklyn	24.50
Delivered Newark or Jersey City	23.53
Delivered Philadelphia	22.84
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown	21.00
F.o.b. Buffalo	21.00
F.o.b. Detroit	21.00
Southern, delivered Cincinnati	21.06
Northern, delivered, Cincinnati	21.44
F.o.b. Duluth	21.50
F.o.b. Provo, Utah	19.00
Delivered, San Francisco, Los Angeles or Seattle	24.50
F.o.b. Birmingham*	17.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	$21.50
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	21.50
F.o.b. Buffalo	20.00
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown	20.50
Delivered Philadelphia	22.34
Delivered Canton, Ohio	21.89
Delivered Mansfield, Ohio	22.44
F.o.b. Birmingham	16.00

Bessemer

F.o.b. Buffalo	$22.00
F.o.b. Everett, Mass.	23.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	23.00
Delivered Newark or Jersey City	24.53
Erie, Pa., and Duluth	22.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown	21.50
F.o.b. Birmingham	22.00
Delivered Cincinnati	22.11
Delivered Canton, Ohio	22.89
Delivered Mansfield, Ohio	23.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	26.50

Gray Forge

Valley or Pittsburgh furnace	$20.50

Charcoal

Lake Superior furnace	$25.00
Delivered Chicago	28.34

Canadian Pig Iron

Per Gross Ton

Montreal

Foundry Iron	$24.50 base
Malleable	25.00 base
Basic	24.50 base

Toronto

Foundry iron	$22.50 base
Malleable	23.00 base
Basic	22.50 base

On all grades 2.25 per cent silicon and under is base. For each 25 points of silicon over 2.25 per cent an extra of 25c. is charged.

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload)	$80.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	$28.00
Domestic, 26 to 28%	33.00

Electric Ferrosilicon

Per Gross Ton Delivered, Lump Size

50% (carload lots, bulk)	$69.50*
50% (ton lots in 50 gal. bbl.)	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50%	$30.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of maganese over 2%, $1 per ton additional. Phosphorus 0.75% or over, $1 per ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50%	$24.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton. The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-Manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon	$83.00
2.50% carbon	88.00
2% carbon	93.00
1% carbon	103.00

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	$1.75
Ferrotungsten, 100 lbs. and less	2.00
Ferrovanadium, contract, per lb. contained V., delivered	$2.70 to $2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots	$2.25†
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	$157.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, $3 unitage, freight equalized with Nashville	$75.00
Ferromolybdenum, per lb. Mo. f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo. f.o.b. furnace	80c.
Molybdenum oxide briquettes 48-52% Mo; per lb. contained Mo, f.o.b. Langeloth, Pa.	80c.

* Spot prices are $5 per ton higher.
† Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$5.25
Old range, non-Bessemer, 51.50%	5.10
Messabi, Bessemer, 51.50%	5.10
Messabi, non-Bessemer, 51.50%	4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria	12c.
Iron, low phos., Swedish, average, 68½% iron	12c.
Iron, basic or foundry, Swedish, aver. 65% iron	11c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	29c.
Man., African, Indian, 44-48%	25c.
Man., African, Indian, 49-51%	28c.
Man., Brazilian, 46 to 48%	27c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered	$18.50
Tungsten, domestic, scheelite delivered	$15.00 to $17.00
Chrome or (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	$15.00
Rhodesian, 45%	19.00
Rhodesian, 48%	22.00
Turkish, 48-49%	22.50
Turkish, 45-56%	19.50
Turkish, 40-44%	17.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%	$24.00
48-49%	23.50

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$18.00
Domestic, f.o.b. Ohio River landing barges	19.00
No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines	19.00
Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	21.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	31.50

FUEL OIL

Per Gal.

No. 2, f.o.b. Bayonne	3.875c.
No. 6, f.o.b. Bayonne	2.50c.
No. 5 Bur. Stds., del'd Chicago	3.25c.
No. 6 Bur. Stds., del'd Chicago	2.75c.
No. 3 distillate, del'd Cleve'd.	5.50c.
No. 4 industrial, del'd Cleve'd.	5.25c.
No. 5 industrial, del'd Cleve'd.	3.00c.
No. 6 industrial, del'd Cleve'd.	2.75c.

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, Prompt	$3.75
Furnace, f.o.b. Connellsville, Prompt	$4.75 to 5.50
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95
Foundry, by-product, delivered Cleveland	10.30
Foundry, by-product, delivered Cincinnati	9.75
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	10.75 to 11.00
Foundry, from Birmingham, f.o.b. cars dock Pacific ports	14.75

. . . GREAT BRITAIN . . .

. . . Some products require four months for delivery

LONDON, June 5 (*By Cable*)—The Continent reports that business has been quieter since Whitsun holiday but still is good with works well placed for several months and delivery delays extending in some cases to four months. Prices are firm.

The steel position in Great Britain is still strong. Whitsun holiday has been virtually ignored as most plants are operating at full capacity. Despite the increased output there is an acute shortage of semi-finished steel.

The new Ministry Supply Bill seeks wide powers to insure full government priority. Scrap is still scarce but is now being augmented by American arrivals. Meantime, consumers are using pig iron, thereby increasing costs.

Large steel business has been placed with a rise and fall clause for the unexpired portion after Oct. 31.

Shipbuilders are specifying greater tonnages for ship steel.

Basic pig iron output is the highest since the 1937 boom, but none is available for the open market. Hematite stocks are still heavy, but foundry pig iron is more active.

Tin plate is moderately active with bookings barely equal to the production which is about 70 per cent. Consumers' purchases cover deliveries up to the end of the year. Prices are firm.

Black galvanized sheet makers are turning out large tonnages for air raid shelters and other government work. Some mills quote November as the earliest shipment for export, but August and September are more general.

The new Hunyad steel plant in Rumania with a yearly capacity of 100,000 metric tons of rolled steel has commenced operations.

CAST IRON PIPE

General Motors, New Departure Division, Bristol, Conn., is having plans and specifications made for a 12-in. pipe line from Birge Pond to plant, about one mile. W. P. Fraser, construction department, is in charge.

Meridian, Miss., plans extensions in water pipe lines. Bond issue of about $200,000 is being arranged for this and other waterworks installation, including new concrete reservoir.

Garland, Tex., plans pipe line extensions and replacements in water system and other waterworks installation. Bond issue of $80,000 has been arranged for this and improvements in sewerage system.

Mauston, Wis., plans about 5000 ft. of 6-in. pipe for extensions in main water lines. Financing is being arranged through Federal aid for this and new sewerage lines. General Engineering Co., Portage, Wis., is consulting engineer.

California Water Service Co., Bakersfield, Cal., plans new pipe lines and replacements in present mains. Construction budget of $242,000 has been arranged for this and other waterworks installation during next 12 months. Early work will include about 2500 ft. of 8-in. for main line extension. S. E. Dillon is manager.

Water Department, Spokane, Wash., has authorized pipe line extensions in main supply and distribution system, using 12, 8 and 6-in. pipe and smaller. Cost about $52,900.

Water Department, Toledo, Ohio, will take bids before this month for main crosstown pipe line for new water supply system from Lake Erie. Greeley & Hansen, 6 North Michigan Avenue, Chicago, are consulting engineers.

McGuffey, Ohio, plans pipe lines for water system and other waterworks installation. Cost about $30,000, of which approximately $14,000 will be a bond issue, to be voted soon.

Wilmette, Ill., will take bids soon for 12-in. pipe for main water line in Lake Avenue.

Milledgeville, Ga., plans pipe line extensions in water system and other waterworks installation. Cost about $87,000, of which approximately $33,000 will be a bond issue. Proposed to begin work in August.

Water Department, Sioux Falls, S. D., plans pipe lines in Wayland Avenue for main water supply. R. E. Bragstad is city engineer.

Wheatridge, Colo., plans pipe lines for water system, including main supply lines. Cost about $50,000. A bond issue is being arranged.

Burbank, Cal., has awarded 15,000 ft. of 4, 6, 8, and 10-in. pipe to United States Pipe & Foundry Co., San Francisco.

East Bay Municipal Utility District, Oakland, Cal., has received low bid from United States Pipe & Foundry Co., San Francisco, on bulk of 1780 tons of 4 to 20-in. pipe.

. . . PIPE LINES . . .

Coltex Refining Co., Snyder, Tex., plans early construction of 4 to 6-in. welded steel pipe line from Sharon, Tex., oil field district to point near Westbrook, Mitchell County, Tex., about 30 miles, for crude oil transmission. Connection will be made with main line of company at latter place. Pumping stations will be installed for booster service.

Houma, La., has authorized bond issue of $250,000 at special election for steel pipe line system for natural gas distribution, including main welded steel pipe line for connection with source of supply, totaling about 170,000 ft. in all; also will build a control station and other operating facilities. Work is scheduled to begin soon. T. Baker Smith is city engineer.

Board of District Commissioners, District Building, Washington, asks bids until June 20 for 48-in. steel pipe line for trunk water service and 20-in. steel pipe line for drain service in grounds of United States Soldiers' Home, with alternate bids on cast iron pipe, same sizes.

Texas-New Mexico Pipe Line Co., Hobbs, N. M., has let contract to Carlson Construction Co., Pampa, Tex., for new 5-in. welded steel pipe line from Lovington oil field, Lea County, N. M., to connection with pumping station at Monument, N. M., about 16½ miles, for crude oil transmission. Booster stations will be provided along route to provide for capacity of 6000 bbl. per day. Company is a subsidiary of Texas Co., Tide Water Associated Pipe Line Co., Sinclair-Prairie Oil Co., and Cities Service Oil Co., all of Houston, Tex.

Alderwood Manor Water District, Alderwood Manor (Snohomish County), Wash., plans about 6800 ft. of 6-in., 16,500 ft. of 3-in., and 4700 lin. ft. of 2-in. steel pipe for extensions in water system from Martha Lake to point near Halls Lake; also about 7600 ft. of 1½-in. cast iron pipe. Fund of about $96,500 is being arranged for this and other work, of which approximately $76,800 is being financed through Federal aid.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, closes bids June 12 for 800 ft. of 4-in. welded steel pipe and 10 welded elbows (Circular 398-148).

Safford, Ariz., plans extensions in proposed natural gas system, with new welded steel pipe lines from city limits to Thatcher and other points in Gila Valley area, to cost about $69,000. This is in addition to bond issue of $135,000 recently voted for steel pipe lines for municipal gas distribution and welded steel pipe line for connection with new pipe line system of El Paso Natural Gas Co., El Paso, Tex., from Gage, N. M., to Globe, Ariz., now in course of construction, which will furnish natural gas for entire area first noted. About 160,000 ft. of 1 to 8-in. diameter steel pipe will be required for Safford installation. Weiland Engineering Co., Pueblo, Colo., is consulting engineer.

Union Gas Co., Chatham, Ont., plans 3-in. steel pipe line from Belle River to Puce, Ont., about six miles, for natural gas transmission. Company plans early purchase of material and will carry out construction with own forces.

Republic Will Enlarge Trumbull Cliffs Stack

CLEVELAND—Republic Steel Corp. plans to rebuild and enlarge the blast furnace at its Warren, Ohio, plant, increasing the daily capacity to 1000 tons, an increase of 33 per cent. Originally known as the Trumbull Cliffs Furnace, this blast furnace was erected in 1921 and slightly enlarged in 1931.

The bosh diameter in the furnace will be increased from 28 ft. 6 in., to 30 ft., the stockline diameter from 19 ft. to 19 ft. 6 in., and the height from the center tuyere to top ring from 84 ft. to 98 ft. 7 in. Since the furnace was originally built it has produced 5,600,000 tons of iron and 1,836,000 tons since it was last relined in 1931. The lining was patched in 1934, 1937 and 1938.

Imports at Philadelphia

PHILADELPHIA—The following iron and steel imports were received here during the past week: 1000 tons of chrome ore from South Africa; 555 tons of pig iron from British India; three tons of wire rods, 32 tons of steel bands, 49 tons of steel tubes, six tons of steel bars and one ton of granular iron from Sweden; and 122 tons of structural shapes from Belgium.

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

American Brake Shoe & Foundry Co., 230 Park Avenue, New York, has let general contract to Universal Construction Co., Scarritt Building, Kansas City, Mo., for one-story addition, 50 x 80 ft., to branch plant at Denver, also remodeling and improving present plant. Cost over $50,000 with equipment.

Union Bag & Paper Corp., Woolworth Building, New York, plans two-story and basement addition to branch converting plant at Hudson Falls, N. Y., 100 x 100 ft. Cost over $75,000 with equipment.

Quartermaster Supply Officer, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until June 12 for solid disk-type wheels, with solid cured-on type rubber tires, 9-in. diameter, overall; solid disk-type load wheels, with solid cured-on type rubber tires, 18-in. diameter overall (Circular 626-279).

General Tire Co. of New York, Inc., 642 West Fifty-seventh Street, New York, has filed plans for extensions and improvements in four-story building, 87 x 131 ft., at 829-35 Eleventh Avenue, for a storage and distributing plant. Cost about $100,000. Francisco & Jacobus, 511 Fifth Avenue, are architects.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 13 for one combination contour metal-sawing, filing and polishing machine (Schedule 6452), radial drill (Schedule 6454), automatic, single-spindle screw machine (Schedule 6456), three milling machines (Schedule 6461), all motor-driven, for Brooklyn Navy Yard.

Continental Can Co., 100 East Forty-second Street, New York, has let general contract to Austin Co., Cleveland, for new five-story and basement plant, 200 x 400 ft., at Jersey City, N. J., for general production, storage and distribution. Cost over $800,000 with equipment.

Rubsam & Horrmann Brewing Co., 191 Canal Street, Stapleton, S. I., New York, has begun construction of two-story addition, about 11,200 sq. ft. of floor space, for expansion in fermenting department and other service. Cost over $40,000 with equipment.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until June 12 for 650,000 ft. of wire (Circular 271); until June 27, 4000 key units (Circular 269), 1000 batteries (Circular 270).

Commanding Officer, Ordnance Department, Watervliet Arsenal, Watervliet, N. Y., asks bids until June 23 for a monorail type conveyor system (Circular 251).

United States Engineer Office, New York District, Army Building, New York, asks bids until June 12 for chain net and four double chain slings (Circular 299).

Commanding Officer, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until June 12 for equipment for collecting and recovering ether and alcohol (Circular 826); until June 13, planetary thread milling machine (Circular 853); until June 14, gas engine-operated electric welding machine and a lathe grinder (Circular 860).

Commanding Officer, Ordnance Department, Raritan Arsenal, Raritan, N. J., asks bids until June 12 for four electric post grinders, portable electric grinder, four electric drills, brake relining machine, two compressors, valve spring tester, set of hydraulic rams, three jacks, piston clamp and other equipment (Circular 112).

Standard Cable Corp., Jersey Shore, Pa., manufacturer of copper wire, cable and allied products, has acquired local building, formerly used as a textile mill, and will remodel for new plant. Cost close to $70,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 20 for 400 aircraft fuel quantity gage check valves (Schedule 6492), 300 centrifugal tachometers (Schedule 6494), 400 aircraft tachometer shafts (Circular 6495) for Philadelphia yard.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until June 13 for one light-type radial drill (Circular 1245), 44 or 45 geared-head engine lathes (Circular 1246), 35 enclosed head bench lathes, three turret lathes, four thread milling machines, three automatic screw machines, four hand screw machines and one profiling machine (Circular 1247).

BUFFALO DISTRICT

E. I. du Pont deNemours & Co., Inc., Niagara Falls, N. Y., has asked bids on general contract for one-story addition to chemical plant, 60 x 200 ft., for storage and distribution. Cost over $75,000 with equipment. Main offices are at Wilmington, Del.

Eastman Kodak Co., Kodak Park, Rochester, N. Y., has authorized immediate erection of seven-story and basement addition, totaling about 260,000 sq. ft. of floor space, for expansion in film-manufacturing division. Cost over $1,000,000 with equipment. Ridge Construction Co., Kodak Park, is general contractor.

Garlock Packing Co., Palmyra, N. Y., mechanical packing for power plants, etc., has approved plans for one-story addition. Cost close to $45,000 with equipment.

WASHINGTON DIST.

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for shop superstructure for gun assembling works at local navy yard (Specifications 9067).

M. J. Grove Lime Co., Lime Kiln (Frederick County), Md., plans new plant near Middletown, Va., comprising buildings for general production, kiln units, storage and distributing structures, power house and shop; also development of rock properties in district for raw material supply. Cost over $200,000 with machinery.

General Purchasing Officer, Panama Canal, Washington, asks bids until June 13 for an electric drill, grinder, spur-geared scroll combination lathe chuck, four-ton trolley, relief valves, liquid sprayers, barrel bolts and other equipment (Schedule 3475); until June 15, 200 water meters, ¾-in. (Schedule 3481).

Construction Service, Veterans' Administration, Washington, asks bids until June 20 for power house at institution at Bath, N. Y., including new boiler unit and auxiliary equipment.

Southern Dairies, Inc., 60 M Street, N. E., Washington, has approved plans for one-story milk-processing plant at Cambria, Va., 85 x 150 ft., with auxiliary structures. It will replace a plant destroyed by fire. Cost about $100,000 with machinery. Eubank & Caldwell, Boxley Building, Roanoke, Va., are architects and engineers.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 13 for hand wheel drive shaft connections, brackets, etc. (Schedule 6447), rough machined plunger forgings (Schedule 6467) for Washington yard; 8700 aluminum cartridge containers (Schedule 6449) for Fort Mifflin, Pa.; 20,000 steel bodies (Schedule 6450) for Portsmouth, N. H., yard; stress relieving furnaces (Schedule 6359) for Eastern and Western yards; until June 16, 4000-lb. platform-type high-lift truck, non-telescoping, storage battery-operated, with battery, and two 4000-lb. electric industrial trucks, with batteries, for Potsmouth, N. H., yard; one 6000-lb. electric industrial truck for Boston yard; 6000-lb. multi-lift, pallet-handling fork truck, storage battery-operated, with battery; 6000-lb. truck-type crane, with telescopic boom, with battery; 10,000-lb. low-lift elevating platform-type truck, with battery, for Philadelphia yard (Schedule 6403).

NEW ENGLAND

Lamper's, Inc., 496 Broad Street, Lynn, Mass., oil products, has approved plans for new bulk oil storage and distributing plant at Lamper Wharf, consisting of loading unit, 50 x 100 ft., concrete pier, pumping station, 13 steel storage tanks and other facilities. Cost about $100,000.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until June 12 for 10,000, 25,000 or 50,000 steel latch clip pins and similar quantities of long steel butt plate screws (Circular 442); until June 13, one universal eccentric relieving machine (Circular 453); until June 15, ⅝-in. hand screw machine (Circular 454), motor-driven, two-spindle automatic plain milling machine (Circular 456).

Newton Robertson & Co., 1146 Albany Avenue, Hartford, Conn., bakers, have asked bids on general contract for new one-story plant, 138 x 175 ft., at 750-60 Wethersfield Avenue. Cost about $75,000 with mixing machinery, traveling ovens, conveyors and other equipment. McCormick Co., Inc., 121 South Negley Street, Pittsburgh, is architect and engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 13 for four motor-driven bench lathes and four sets of cast iron spring chucks (Schedule 6423), 12 motor-driven hand screw machines (Schedule 6448); until June 16, one motor-driven engraving machine (Schedule 6499) for Newport, R. I., naval station; fuel oil heaters and spare parts (Schedule 6440) for Boston and Charleston yards.

SOUTH ATLANTIC

Albany Coca-Cola Bottling Co., Albany, Ga., has asked bids on general contract for one-story mechanical-bottling plant. Cost about $50,000 with equipment. Robert & Co., Bona Allen Building, Atlanta, Ga., are architects and engineers.

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for two 15-ton electric traveling revolving hinged jib cranes for shipway service at Charleston, S. C., navy yard (Specifications 9215).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 16 for two platform-type electric trucks, with batteries; 10,000-lb. heavy-duty electric crane truck, with telescoping compensating boom, with batteries, for Charleston, S. C., yard (Schedule 6403).

SOUTH CENTRAL

Alabama State Dock Commission, Mobile, Ala., has let contract to Rust Engineering Co., Clark Building, Pittsburgh, for one-story transit building at local State docks, at $168,400, with conveying, loading and other mechanical-handling equipment. J. B. Converse & Co., Inc., Mobile, is consulting engineer.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until June 15 for about 999,000 ft. of copper cable for 154-kv. transmission line from Wheeler hydroelectric power plant to Columbia, Tenn., line No. 2; until June 21, hydraulic turbines, with or without governors, for Wheeler hydroelectric power station; until June 26, two 36,000-kva. electric generators for last noted power plant, to be known as units Nos. 3 and 4.

Board of Trustees of Institutions of Higher Learning, Jackson, Miss., has asked bids on general contract for extensions and improvements in forge shop, foundry and woodworking shop at Mississippi State College, State College, Miss. Stevens & Johnson, Starkville, Miss., are architects and engineers.

United States Engineer Office. Louisville, asks bids until June 28 for Turtle Creek pumping station, Gill Township Levee unit, Sullivan County, Ind., including motor-driven pumping units and accessories, transformers and auxiliary equipment; also for about six miles of electric transmission line.

SOUTHWEST

C. Hager & Son Hinge Mfg. Co., 2447 DeKalb Street, St. Louis, wrought steel hinges and other hardware products, has let general contract to A. H. Haeseler Building & Contracting Co., 2346 Palm Street, for two-story addition, 79 x 145 ft., for storage and distribution. Cost over $65,000 with equipment.

Boonville Mills Co., Boonville, Mo., flour and grain, has let general contract to Ryan Construction Co., Omaha National Bank Building, Omaha, Neb., for addition to grain storage department, providing about 100,000 bu. additional capacity, with bin units and other facilities. Cost over $60,000 with equipment. Horner & Wyatt, Board of Trade Building, Kansas City, Mo., are consulting engineers.

Cooperative Refinery Association, recently organized subsidiary of Consumers Cooperative Association, Fifteenth and Iron Streets, N. W., North Kansas City, Mo., plans new oil refinery at Phillipsburg, Kan., where site has been acquired, with steel tank storage facilities, pumping station, power house and other structures. Cost close to $100,000 with equipment.

Globe Oil Tool Co., Oklahoma City, Okla., oil well drilling tools and equipment, has leased one-story building to be erected on Liberty Road, Houston, Tex., for plant, removing from Oklahoma City and increasing capacity.

Magnolia Petroleum Co., Esperson Building, Houston, Tex., has plans for new gas repressuring plant at oil properties in Winkler County, Tex., with compressor station and other operating departments. Cost close to $200,000 with equipment. Company is a subsidiary of Socony-Vacuum Oil Co., New York.

Purchasing and Contracting Officer, Normoyle Quartermaster Depot, San Antonio, Tex., asks bids until June 15 for automatic centering gages, carburetor jet drill gages, oil pan and oil distributor gages, electric hammers, 20-ton hydraulic jacks, welding and cutting equipment, vapor spray cleaner, piston pull gages, paint spray guns and other equipment (Circular 632-9).

WESTERN PA. DIST.

Board of Education, McKeesport, Pa., plans early construction of new multi-story vocational high school on 35-acre tract in Versailles Township, adjoining city limits, following court authority to proceed with project. Cost about $1,071,000. Financing has been arranged in part through Federal aid.

Union Charcoal & Chemical Co., Sheffield, Pa., industrial chemical products, plans rebuilding part of plant recently destroyed by fire. Loss about $75,000 with equipment.

United States Engineer Office, New Post Office Building, Pittsburgh, asks bids until June 26 for two 54-in. butterfly valves, each with operating machinery, for installation at Mahoning dam, near Dayton, Pa. (Circular 670).

OHIO AND INDIANA

Forest City Brewery, Inc., 6900 Union Avenue, S. E., Cleveland, plans expansion in mechanical-bottling works, and storage and distributing department. Cost about $90,000. Financing is being arranged through sale of stock issue.

City Council, Sandusky, Ohio, R. L. J. Wagar, city manager, is considering new power plant at municipal waterworks station, to include three 1000-hp. high-speed diesel engine units with accessories, three 650-kw. generating units, fuel oil storage system and unloading facilities, switch-gear, piping, etc. Cost close to $265,000. E. E. Hartung, City Hall, is city engineer.

Contracting Officer, Materiel Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until June 12 for galvanized conduit, bushings, elbows, lock nuts, power panels, 38,500 ft. of wire, six steel cabinets and other equipment (Circular 1120); until June 13, flathead pins and taper threaded pins (Circular 1127); until June 14, generator spline shaft and spring assemblies, generator cam assemblies, generator cam keys, starter clutch baffle plate assemblies (Circular 1124), counterweight bearing retainers, counterweight bearing retainer spacers, counterweight bearing shafts, counterweight bearing shaft bearings, etc. (Circular 1116).

Kroger Grocery & Baking Co., 35 East Seventh Street, Cincinnati, plans new power house at branch plant at 2210 Lockburne Road, Columbus, Ohio, including engine-generator unit and auxiliary equipment. Cost about $50,000 with equipment. A. M. Kinney, Inc., Carew Tower Building, Cincinnati, is consulting engineer.

Sunbeam Electric Co., Read Street and Morgan Avenue, Evansville, Ind., automobile headlights, etc., plans two-story addition, 55 x 200 ft. Cost over $85,000 with equipment. Edward C. Berendes, 121 N. W. Fourth Street, is architect.

MICHIGAN DISTRICT

Chrysler Corp., Detroit, has let general contract to William P. Neil Co., 4814 Loma Vista Avenue, Los Angeles, for one-story addition, 160 x 280 ft., to branch plant at 5800 Eastern Avenue, Los Angeles, operated in name of Chrysler Motors of California, Inc., for expansion in parts and assembling departments, with portion for storage and distribution. Cost close to $175,000 with equipment. Chrysler Motor Parts Corp., Detroit, subsidiary of Chrysler Corp., has let general contract to Lindgren & Swinerton, Inc., Standard Oil Building, San Francisco, for one-story branch plant at San Leandro, Cal., where 10-acre tract recently was acquired, totaling close to 50,000 sq. ft. of floor space, for service, storage and distribution. Cost about $150,000 with equipment. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer for last noted structure.

Lake States Refining Co., Bloomingdale, Mich., recently organized by Rae Lewis, Ovid, Mich., and associates, has begun construction of new oil refinery at first noted place, to include pumping station, power house, steel tank storage department and other structures. Cost close to $90,000 with equipment.

MIDDLE WEST

Montgomery Ward & Co., West Chicago and North Larabee Avenues, Chicago, have asked bids on general contract for four-story machine shop, storage and distributing building, also for two-story storage and distributing building, 104 x 160 ft., at Chicago Heights. Cost over $100,000 with equipment. E. H. Hughes, first noted address, is company architect.

Union Starch & Refining Co., Granite City, Ill., plans extensions and improvements including one-story machine shop addition and power house equipment, comprising boiler unit, engine-generator and accessories. Cost about $70,000. Main offices are at Columbus, Ind.

Chicago Metallic Mfg. Co., 3711 South Ashland Avenue, Chicago, tinware products, has let general contract to Anderson & Winblad, 6235 South Michigan Avenue, for one-story addition, 100 x 103 ft. Cost close to $65,000 with equipment. A. Epstein, 2001 West Pershing Road, is architect and engineer.

City Council, Bancroft, Iowa, will receive bids until June 20 for new municipal electric power plant, including two diesel engine-generator units with accessories, each about 450 bhp. rating, and auxiliary equipment; also for electrical distributing lines. Cost about $100,000. A. S. Harrington, Baum Building, Omaha, Neb., is consulting engineer.

A. E. Staley Mfg. Co., Decatur, Ill., manufacturer of oils, starch and allied refined products, has authorized plans for two new units for soy bean oil production, consisting of a one-story structure for processing and another for drying and preparation. Cost over $500,000 with equipment.

Elliott & Co., Thirty-seventh Avenue West and Oneota Street, Duluth, Minn., meat packers, have let general contract to Bergstrom & Gustafson, Duluth, for several one-story units for expansion in different production divisions. Cost close to $100,000 with equipment. Henschien, Everds & Crombie, 59 East Van Buren Street, Chicago, are architects and engineers.

City Council, Fort Collins, Colo., plans expansion and improvements in municipal electric power plant, including new boiler unit, turbo-generator and auxiliary equipment. Cost about $320,000. Financing is being arranged through Federal aid.

PACIFIC COAST

Clarkiron Co., 20101 Normandie Avenue, Los Angeles, Earl Reynolds, president, plans new iron ore-extraction plant on site now being selected near city, with power house, machine shop and other mechanical departments. Cost in excess of $500,000 with machinery. W. G. Clark is metallurgical engineer for company.

Pacific B'ow Pipe Co., N. E. Gilson and Eleventh Streets, Portland, has let general contract to Bingham Construction Co., Couch Building, for new one-story plant, 100 x 200 ft., on N. E. Flanders Street. Cost over $65,000 with equipment. Cash & Wolfe, Railway Exchange Building, are architects.

Purchasing Officer, Department of Interior, Washington, asks bids until June 12 for one steel lookout tower, 80 ft. high, at Madras, Ore. (Circular 4993).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 16 for two motor-driven engine lathes and spare parts (Schedule 6430), corrosion-resisting steel welding electrodes (Schedule 6421) for Mare Island Navy Yard; six 4000-lb. each, four-wheel platform-type electric trucks, with storage batteries, for San Diego naval air station; 6000-lb. portable, swivel-type electric crane, with battery; 6000-lb. high-lift electric, telescoping truck, with battery, for Mare Island yard (Schedule 6403); until June 23, two motor-driven ram-type turret lathes (Schedule 6480) for Puget Sound yard.

Idaho Power Co., Boise, Idaho, has let general contract to C. O. Jordan & Sons, Thirteenth and Fort Streets, for one-story and basement equipment, service and repair building, 140 x 155 ft., with garage and service division for company trucks and cars. Cost over $80,000 with equipment.

FOREIGN

International Alloys, Ltd., Buckingham Avenue, Slough, Buckshire, England, aluminum and aluminum alloys, has acquired about 20-acre tract at Cardiff, Wales, for new plant, with option on an adjoining 40 acres for future expansion. Initial works will comprise several one and multi-story units for production of products noted, as well as magnesium and allied materials. Plant is estimated to require from 18 to 24 months for completion and will cost over $2,000,000 with machinery.

Aluminum Co. of Canada, Ltd., 1010 Ste. Catherine Street, Montreal, Que., has let general contract to Foundation Co. of Canada, Ltd., Montreal, for one-story addition to branch plant at Arvida, Que., for raw material storage and distribution. Cost about $200,000 with mechanical-handling and other equipment. Company is a subsidiary of Aluminum Co. of America, Inc., Pittsburgh.

W. G. Goetz & Son, Ltd., West Melbourne, Victoria, Australia, recently organized to take over company of same name, with plant for production of sheet metal machinery and parts, has selected site near Spotswood, in Melbourne district, for new one-story plant where operations will be transferred and expanded. Property at first noted place has been sold. Cost close to $100,000 with equipment.

. . . NON-FERROUS . . .

. . . Domestic copper demand in fair volume . . . Spelter sales gain to 4778 tons . . . Lead sellers experience another active week . . . Tin market dull but prices are firm.

NEW YORK, June 6—The domestic non-ferrous markets showed a generally firmer undertone in the past week as practically all markets experienced fairly active consumer demands. There was no indication of speculative interest in any of the markets. Copper buyers, apparently feeling that 10c. represents the bottom of the present price movement, covered fairly heavily in the last half of the week, with Wednesday's total of 9600 tons, mostly for September, representing the week's highest daily total. Producers' prices here are very firm at the unchanged level of 10c. per lb., delivered, Connecticut Valley. In the open market 10c. also rules, buyers showed little interest in this market in the absence of concessions from the producers' base. Interest in the export market was also well maintained all week and prices worked up to 10.17c. per lb., c.i.f., usual base ports, on Monday, but eased to 10.125c. this morning. On Monday a week ago the foreign price was 10.05c. per lb.

Zinc

With no evidence in sight of the likelihood of an important decline in London prices, but rather with all signs indicating the possibility of higher prices there, domestic consumers purchased 4778 tons of prime Western metal in the past week. This represents a gain of 834 tons over the previous market period, and is the highest weekly total in exactly one month. Movement of zinc into consumption continues at a steady pace, the past week's shipments amounting to 4072 tons against 3638 tons in the preceding week. Most of the week's buying was for August and September shipment. Domestic quotations are firmly entrenched at 4.89c. per lb., New York. This morning's London price was 2.93c. per lb., practically unchanged from a week ago.

Lead

Another six days of excellent buying, in both June and July positions, was experienced in the past week and again sellers were forced to dip deeply into reserves to accomodate the demand. Present indications are that May shipments may be in excess of 40,000 tons which would be a record for the year. With June needs already 70 per cent covered and July about 30 per cent, a slackening in current demand would not be wholly unexpected. Prices here are firm and unchanged at 4.75c. per lb., New York, and the London price continues to fluctuate around the £14 level, this morning's spot equivalent being 3c. per lb.

Tin

There was very little buying of tin in the past week, but prices were fairly steady due chiefly to the shortage of usable brands resulting from the operations of the buffer pool. Prompt Straits ruled at 49c. per lb., New York, most of the past week, but edged off to 48.90c. on Monday and then to 48.75c. today. In London the week's turnover involved only moderate tonnages at prices little changed from the week previous.

May Average Prices

The average prices of the major non-ferrous metals in May, based on quotations appearing in THE IRON AGE, were as follows:

	Per lb.
Electrolytic copper, Conn. Valley	10.06c.
Lake copper, Eastern delivery	10.06c.
Straits tin, spot, New York	49.00c.
Zinc, East St. Louis	4.50c.
Zinc, New York	4.89c.
Lead, St. Louis	4.60c.
Lead, New York	4.75c.

NON-FERROUS PRICES

Cents per lb. for early delivery

	May 23	June 1	June 2	June 3	June 5	June 6
Copper, Electrolytic[1]	10.00	10.00	10.00	10.00	10.00	10.00
Copper, Lake	10.00	10.00	10.00	10.00	10.00	10.00
Tin, Straits, New York	49.00	49.00	49.00	....	48.90	48.75
Zinc, East St. Louis[2]	4.50	4.50	4.50	4.50	4.50	4.50
Lead, St. Louis[3]	4.60	4.60	4.60	4.60	4.60	4.60

[1] Delivered Conn. Valley. Deduct ¼c. for New York delivery. [2] Add 0.39c. for New York delivery. [3] Add 0.15c. for New York delivery.

Warehouse Prices

Cents per lb., Delivered

	New York	Cleveland
Tin, Straits pig	49.75c.	52.00c.
Copper, Lake	11.25c.	11.125c.
Copper, electro	11.125c.	11.125c.
Copper, Castings	10.75c.	10.875c.
*Copper sheets, hot-rolled	18.12c.	18.12c.
*High brass sheets	16.48c.	16.48c.
*Seamless brass tubes	19.23c.	19.23c.
*Seamless copper tubes	18.62c.	18.62c.
*Brass rods	11.85c.	11.85c.
Zinc slabs	6.15c.	6.90c.
Zinc sheets, No. 9 casks	10.50c.	12.10c.
Lead, American pig	5.75c.	5.60c.
Lead, bar	6.35c.	8.25c.
Lead, sheets, cut	8.00c.	8.00c.
Antimony, Asiatic	15.00c.	17.00c.
Alum., virgin, 99 per cent plus	22.50c.	22.50c.
Alum., No. 1 remelt., 98 to 99 per cent	19.50c.	19.50c.
Solder, ½ and ½	29.375c.	29.75c.
Babbitt metal, commercial grade	21.50c.	21.75c.

* These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 1/3; on brass sheets and rods, 40, and on brass and copper tubes, 25.

Old Metals

Cents per lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their uses.

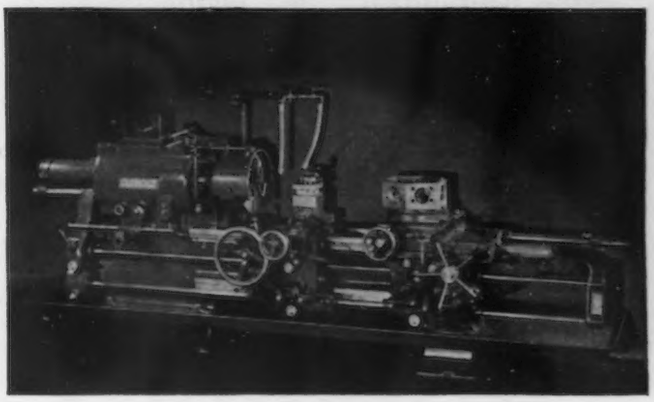
	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	8.00c.	9.625c.
Copper, hvy. and wire	7.00c.	7.375c.
Copper, light and bottoms	6.125c.	6.375c.
Brass, heavy	4.125c.	4.625c.
Brass, light	3.25c.	4.00c.
Hvy. machine composition	6.125c.	7.625c.
No. 1 yel. brass turnings	4.00c.	4.50c
No. 1 red brass or compos. turnings	6.00c.	6.50c.
Lead, heavy	3.625c.	4.50c.
Cast aluminum	6.50c.	7.75c.
Sheet aluminum	12.25c.	13.75c.
Zinc	2.125c.	3.375c.

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered; virgin, 99 per cent plus, 20c.-21c. a lb.: No. 12 remelt No. 2 standard, 19c.-19.50c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt, New York: Asiatic, 14c. a lb., f.o.b.: American, 12c. a lb. QUICKSILVER, $85-$87 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 10.25c. a lb.

AMPCO METAL

. . . STANDARD FOR THE EXACTING SPECIFICATIONS OF GISHOLT LATHES



Gisholt 2L High Production Turret Lathe

THE LEADING METAL TODAY FOR EVERY PART THAT'S *STRESSED* . . .

Internationally known as builders of fine machine tools, Gisholt Machine Company early recognized the necessity of better materials to meet their exacting requirements.

Ampco Metal has been tried and proven to their entire satisfaction, and is now standard for from fifteen to twenty-five parts per model. Wherever parts are highly stressed and a non-ferrous material is indicated, Ampco Metal is used. Bushings and sleeves, pinions and worm gears of Ampco Metal give far longer service than other so-called "just-as-good" materials. It has proved its superior wearability, and that it can maintain alignments and accuracy.

Wherever there is stress . . . Ampco Metal has no equal.

1500 USERS CAN'T BE WRONG!

An alloy is no better than its process. The technique of alloying for the development of the Ampco Phase sums up years of experimentation—trial and error. The makers of Ampco Metal rest their case on the finished product—the bronze that is better . . . the product that carries its own proof of superiority.

There are six grades of Ampco Metal available from the makers or from leading foundries authorized to pour Ampco castings . . . and indentified for your protection by the registered diamond-shaped Ampco trademark.

Write for File "40"—the bound volume of Ampco Engineering Sheets. Test *your* metal —and you will choose Ampco!

AMPCO METAL, INC., Dept. IR-86, Milwaukee, Wis.

AMPCO METAL

"The Metal without an Equal"

. . . distinguished by this mark.

THIS WEEK'S MACHINE ... TOOL ACTIVITIES ...

... Cincinnati builders report a pick-up in domestic sales in the last fortnight ... Automotive and aircraft buying are recent factors ... Business generally improved, though spotty, with May a record month for some.

Cincinnati Builders Report Gain in Domestic Orders

CINCINNATI—The closing days of May and the first few days in June reflected a small improvement in domestic ordering and a correspondent general increase in demand in the Cincinnati machine tool market. Foreign ordering is showing relatively no change, but the reported moderate improvement in local business tends to narrow the gap that heretofore obtained between the two types of business. Most interesting on the improvement is a moderate increase in the planer and boring mill domestic business. Heretofore, this type of machine was mostly prominent on the foreign demand, but manufacturers of these types report that during the past week, their domestic ordering went upward. There is nothing, however, in the report to indicate that a definite trend has set in, especially since Government demand accounts for some of the more optimistic business reports. Lathe manufacturers reported that business is continuing at a good pace with the disparity between foreign and domestic virtually obliterated, although the interest in turret lathes is still dragging. Inquiry for all types of tools continues to be fairly brisk and of more than information seeking character. Manufacturers report a fair number of projects now in the offing which should keep the current month well above normal seasonal rate.

Factory operation is unchanged at approximately 60 per cent.

May Volume Best in Two Years for Some Sellers

CLEVELAND—For one producer here aggregate May orders were the heaviest of any month since the middle of 1937. The increase was due to domestic buying headed by the aircraft industry. Foreign business declined slightly. Large orders were lacking in both domestic and foreign divisions for this company. One dealer operating in northern Ohio and Michigan reports that May sales were the best since June, 1937. This gain is strictly domestic and largely due to the automotive industry, which has been more active recently.

Erie Railroad is inquiring for two lathes, a 16-in. and an 18-in. Recent sales include finishing equipment for a Toledo parts maker, an hydraulic broaching machine, nine engine lathes for various plants of a large independent automobile manufacturer, and several turret lathes for the same buyer. Award of $2,500,000 for propelling equipment for the U. S. Navy has been announced by the local diesel engine division of General Motors Corp., assuring full time operations for the next 12 months.

May Dollar Volume Up In Chicago District

CHICAGO—Machine tool sellers report dollar volume for the month of May in excess of the previous 30-day period although in most cases the number of units sold was fewer. Prospects for the current month are not particularly encouraging but feeling persists that business will continue about on a par with May. Within the next two weeks considerable buying by the International Harvester Co. is confidently expected. Most of these machines will be shipped to the tractor works in Chicago. Some local machinery sellers believe a concerted effort should be made to persuade companies with excess cash to purchase new equipment on the theory that money in the bank is stagnant because of low interest rates and because of the great lack of attractive investment possibilities. Sales of small tools during May showed an improvement over April.

Auto Strike Affects Tool And Die Work in Detroit

DETROIT—A large part of the 1940 tool and die work scheduled for Chrysler and a considerable portion of the Ford work are tied up because of the Briggs strike. At least 1200 die workers are directly affected in the Briggs die shop. The strike has also prevented other activity in connection with equipment planned for Briggs 1940 production and is resuting in some delay in the shipping and installing of machine tools.

Market in the East Lacks a Broad Base

NEW YORK—Machine tool buying in lower New York State, northern New Jersey and nearby New England points is still very spotty. An occasional order comes in from unexpected quarters, but the large nationally known plants are mostly out of the market at the moment. An exception is a railroad equipment builder which has bought machine tools in the past week, following earlier commitments. The aircraft industry still furnishes the chief background of the market and when a dealer is not favored by orders from this source in any one week, business from scattered sources makes the week's volume rather thin. The volume of inquiries has fallen off rather sharply, leaving most sellers to look forward to a dull summer period.

Heavy Buying by Arsenals And Navy Yards

BOSTON—Continuous buying of large and small tools for the Portsmouth, N. H., and Boston navy yards, the Springfield and Watertown, Mass., arsenals, Newport, R. I., training station, and the three leading New England shipyards is the outstanding feature of the market. Buying by New England industrial firms is comparatively quiet, but New England machine tool builders are obtaining good business from other sections of the country.

April Machinery Exports Advance

WASHINGTON—The Commerce Department's Machinery Division reported last week that April exports of industrial machinery, valued at $24,592,486, were 4 per cent higher than shipments in April a year ago. At the same time the department said that April foreign consignments of power-driven metal-working machinery, valued at $8,854,755, decreased below the record volume shipped in March, 1939, but were 13 per cent higher than corresponding shipments in April, 1938.

With the exception of power generating and construction and conveying equipment, which decreased 38 and 16 per cent respectively below the April, 1938, figures, exports of all other major industrial machinery groups increased, the department said. Heavy shipments of rolling mill equipment accounted for the major increase which brought the April, 1938, exports of power-driven metal-working equipment up to 13 per cent to $8,854,755.

Comparable figures for other major types of power-driven metal-working equipment follow: Lathes, $1,104,093 against $1,325,308 in April, 1938; drilling machines, $187,249 against $348,694; vertical boring mills and chucking machines, $291,093 against $409,056; planers and shapers, $348,268 against $148,534; grinding machines, $1,366,664 against $1,716,684; sheet and plate metal working machinery, $661,681 against $572,207; and foundry and molding equipment, $89,477 against $149,909.

Shipments of metal-working machinery other than power-driven during April were 4 per cent greater than a year ago, or $526,203 compared with $505,230, the announcement said. Exports of pneumatic portable tools declined to $129,566 from $254,269, while the trade in other portable metal-working machines advanced to $156,164 from $119,952.